Access DB# 121351

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Maribel Medina Examiner #: 76677 Date: 5/5/04
Art Unit: 1754 Phone Number 30_____ Serial Number: 10/044813
Mail Box and Bldg/Room Location: REM 9A25 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _____

Inventors (please provide full names): _____

5

Earliest Priority Filing Date: _____

For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

****

STAFF USE ONLY	**Type of Search**	**Vendors and cost where applicable**
Searcher: _____	NA Sequence (#)_____	STN _____
Searcher Phone #: _____	AA Sequence (#)_____	Dialog _____
Searcher Location: _____	Structure (#) _____	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic _____	Dr.Link _____
Date Completed: _____	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: _____	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: _____	Other _____	Other (specify)_____

PTO-1590 (8-01)

=> file reg
FILE 'REGISTRY' ENTERED AT 13:49:48 ON 12 MAY 2004

Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 11 MAY 2004 HIGHEST RN 681211-23-4
DICTIONARY FILE UPDATES: 11 MAY 2004 HIGHEST RN 681211-23-4

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 6, 2004

Please note that search-term pricing does apply when conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. For more information enter HELP PROP at an arrow prompt in the file or refer to the file summary sheet on the web at:
http://www.cas.org/ONLINE/DBSS/registryss.html

=> file caplus
FILE 'CAPLUS' ENTERED AT 13:49:51 ON 12 MAY 2004

FILE COVERS 1907 - 12 May 2004 VOL 140 ISS 20
FILE LAST UPDATED: 11 May 2004 (20040511/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> file wpix
FILE 'WPIX' ENTERED AT 13:49:54 ON 12 MAY 2004

FILE LAST UPDATED: 11 MAY 2004 <20040511/UP>
MOST RECENT DERWENT UPDATE: 200430 <200430/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

>>> FOR A COPY OF THE DERWENT WORLD PATENTS INDEX STN USER GUIDE, PLEASE VISIT:
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>>> THE DISPLAY LAYOUT HAS BEEN CHANGED TO ACCOMODATE THE NEW FORMAT GERMAN PATENT APPLICATION AND PUBLICATION NUMBERS. SEE ALSO:
http://www.stn-international.de/archive/stnews/news0104.pdf <<<

>>> SINCE THE FILE HAD NOT BEEN UPDATED BETWEEN APRIL 12-16 THERE WAS NO WEEKLY SDI RUN <<<

=> file compendex
FILE 'COMPENDEX' ENTERED AT 13:50:07 ON 12 MAY 2004

FILE LAST UPDATED: 10 MAY 2004 <20040510/UP>
FILE COVERS 1970 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN THE BASIC INDEX >>>

=> file metadex
FILE 'METADEX' ENTERED AT 13:50:15 ON 12 MAY 2004

FILE LAST UPDATED: 6 APR 2004 <20040406/UP>
FILE COVERS 1966 TO DATE.

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>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN THE
    BASIC INDEX (/BI) <<<

=> d quel49
L76 HAS NO ANSWERS
L76             0 SEA FILE=REGISTRY ABB=ON  PLU=ON  CAPLUS


=> d que l49
L2  (          12) SEA FILE=REGISTRY ABB=ON  PLU=ON  (109-66-0/BI OR 110-54-3/BI
                   OR 122-32-7/BI OR 1333-74-0/BI OR 13770-96-2/BI OR 16853-85-3/B
                   I OR 16940-66-2/BI OR 16949-15-8/BI OR 7580-67-8/BI OR
                   7646-69-7/BI OR 7693-27-8/BI OR 7789-78-8/BI)
L3  (           1) SEA FILE=REGISTRY ABB=ON  PLU=ON  (TRIGLYCERIDE OR TRIOLIN)
                   AND L2
L4  (           1) SEA FILE=REGISTRY ABB=ON  PLU=ON  1333-74-0
L5  (           1) SEA FILE=REGISTRY ABB=ON  PLU=ON  7580-67-8
L6  (           1) SEA FILE=REGISTRY ABB=ON  PLU=ON  7693-27-8
L7  (       31422) SEA FILE=REGISTRY ABB=ON  PLU=ON  (MG(L)H)/ELS
L8  (       60494) SEA FILE=REGISTRY ABB=ON  PLU=ON  (LI(L)H)/ELS
L9  (      229264) SEA FILE=CAPLUS ABB=ON  PLU=ON  L7
L10 (      121106) SEA FILE=CAPLUS ABB=ON  PLU=ON  L8
L11 (         620) SEA FILE=CAPLUS ABB=ON  PLU=ON  L6
L12 (        3558) SEA FILE=CAPLUS ABB=ON  PLU=ON  L5
L13 (      285596) SEA FILE=CAPLUS ABB=ON  PLU=ON  L4
L14 (        3752) SEA FILE=CAPLUS ABB=ON  PLU=ON  L3
L15 (       93600) SEA FILE=CAPLUS ABB=ON  PLU=ON  (HYDROGEN OR H2)(3A)(MANUFACTUR
                   E? OR PROCESS? OR PRODUC? OR ISOLAT? OR EXTRACT?)
L16 (       10177) SEA FILE=CAPLUS ABB=ON  PLU=ON  HYDROGEN(4A)GENERAT?
L17 (      101031) SEA FILE=CAPLUS ABB=ON  PLU=ON  L15 OR L16
L18 (        1163) SEA FILE=CAPLUS ABB=ON  PLU=ON  L17 AND HYDRIDES?
L19 (         991) SEA FILE=CAPLUS ABB=ON  PLU=ON  (L13 OR HYDROGEN OR H2) AND
                   (MAGNESIUM HYDRIDE OR H2MG OR L9 OR L11) AND (L10 OR L12 OR
                   LITHIUM HYDRIDE OR HLI)
L20 (         105) SEA FILE=CAPLUS ABB=ON  PLU=ON  L17 AND L19
L21 (          18) SEA FILE=CAPLUS ABB=ON  PLU=ON  L18 AND L19
L22 (         105) SEA FILE=CAPLUS ABB=ON  PLU=ON  L20 OR L21
L23 (       72923) SEA FILE=CAPLUS ABB=ON  PLU=ON  FUEL(4A)CELL OR ((COMBUSTION
                   OR POWER)(4A)(ENGINE OR MOTOR))
L24 (          19) SEA FILE=CAPLUS ABB=ON  PLU=ON  L22 AND (FUEL OR ENGINE OR
                   MOTOR OR AUTO?)
L25 (           2) SEA FILE=CAPLUS ABB=ON  PLU=ON  L19 AND L14
L26 (          43) SEA FILE=CAPLUS ABB=ON  PLU=ON  L19 AND OIL
L27 (           4) SEA FILE=CAPLUS ABB=ON  PLU=ON  L23 AND (L25 OR L26)
L28            21  SEA FILE=CAPLUS ABB=ON  PLU=ON  L27 OR L24
L29         23492  SEA FILE=WPIX ABB=ON  PLU=ON  (HYDROGEN OR H2)(4A)(GENERATE?
                   OR PRODUC? OR MANUFACTURE? OR MAKE OR FABRICATE? OR MANUFACTURE
                   ?)
L34             1  SEA FILE=WPIX ABB=ON  PLU=ON  L29 AND (ADDITIVE OR DISPERSANT
                   OR GLYCERIDES) AND (MAGNESIUM OR MG OR LITHIUM OR LI)(4A)HYDRID
                   ES
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L35          3 SEA FILE=WPIX ABB=ON  PLU=ON  L29 AND (ADDITIVE OR DISPERSANT
               OR GLYCERIDES OR ADJUVANT OR CARRIER OR SOLVENT) AND (MAGNESIUM
                OR MG OR LITHIUM OR LI)(4A)HYDRIDES
L36          3 SEA FILE=WPIX ABB=ON  PLU=ON  L29 AND (ADDITIVE OR DISPERSANT
               OR GLYCERIDES OR ADJUVANT OR CARRIER OR SOLVENT OR LIQUID?)
               AND (MAGNESIUM OR MG OR LITHIUM OR LI)(4A)HYDRIDES
L37         11 SEA FILE=WPIX ABB=ON  PLU=ON  L29 AND (MAGNESIUM OR MG OR
               LITHIUM OR LI)(4A)HYDRIDES
L39         11 SEA FILE=WPIX ABB=ON  PLU=ON  (L34 OR L35 OR L36 OR L37)
L40         11 SEA FILE=WPIX ABB=ON  PLU=ON  L39 AND (HYDROGEN? OR SEPARATION
               OR GENERAT? OR PRODUC? OR MANUFACT?)
L42          9 SEA FILE=COMPENDEX ABB=ON  PLU=ON  L39 AND (HYDROGEN? OR
               SEPARATION OR GENERAT? OR PRODUC? OR MANUFACT?)
L43          1 SEA FILE=JAPIO ABB=ON  PLU=ON  L39 AND (HYDROGEN? OR SEPARATION
                OR GENERAT? OR PRODUC? OR MANUFACT?)
L44          6 SEA FILE=METADEX ABB=ON  PLU=ON  L39 AND (HYDROGEN? OR
               SEPARATION OR GENERAT? OR PRODUC? OR MANUFACT?)
L45          4 SEA FILE=METADEX ABB=ON  PLU=ON  L44 AND (FUEL OR ENERGY)
L46          5 SEA FILE=COMPENDEX ABB=ON  PLU=ON  L42 AND (FUEL OR ENERGY)
L47          6 SEA FILE=WPIX ABB=ON  PLU=ON  L40 AND (FUEL OR ENERGY)
L48         21 SEA FILE=CAPLUS ABB=ON  PLU=ON  L28 AND (FUEL OR ENERGY)
L49         34 DUP REM L48 L47 L46 L45 L43 (3 DUPLICATES REMOVED)

=> d ti 1-34 l49
YOU HAVE REQUESTED DATA FROM FILE 'JAPIO, METADEX, COMPENDEX, WPIX, CAPLUS' -
CONTINUE? (Y)/N:y


L49  ANSWER 1 OF 34  CAPLUS  COPYRIGHT 2004 ACS on STN
TI   Method of fabrication of microfibrous fuel cells and
     fuel cell assemblies

L49  ANSWER 2 OF 34  CAPLUS  COPYRIGHT 2004 ACS on STN
TI   Alkali metal or alkaline earth metal borohydride and an oxidizing salt
     based on ammonium, alkali metal or alkaline earth metal perchlorate
     containing solid compositions for generating hydrogen
     by combustion

L49  ANSWER 3 OF 34  CAPLUS  COPYRIGHT 2004 ACS on STN
TI   Alkali metal or alkaline earth metal borohydride and strontium nitrate
     containing solid compositions for generating hydrogen
     by combustion

L49  ANSWER 4 OF 34  CAPLUS  COPYRIGHT 2004 ACS on STN
TI   Hydrogen release at ambient temperature from aluminum-based
     hydride materials by mechanical treatment in the presence of a catalyst

L49  ANSWER 5 OF 34  CAPLUS  COPYRIGHT 2004 ACS on STN
TI   Oxidation treatment of clay raw materials containing pyrite for decreased
     sulfur content, less efflorescence and shorter firing time.
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L49 ANSWER 6 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Differential pressure-driven borohydride based **generator** for **hydrogen**

L49 ANSWER 7 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solutions for **fuel** cells

L49 ANSWER 8 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Electric power **generator** for e.g. electronic shelf label, comprises **fuel** cell with anode and cathode separated by proton exchange membrane(s), and **hydrogen generator** comprising catalyst and water based **fuel.**

L49 ANSWER 9 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI **Hydrogen**-fueled motor vehicle, e.g. car, includes **hydrogen**-fueled locomotion subsystem, and refuelable **hydrogen generator** comprising electrochemical reactor, and refueling subsystem.

L49 ANSWER 10 OF 34 COMPENDEX COPYRIGHT 2004 EEI on STN DUPLICATE 1
TI Nanocrystalline metallic **hydrides** for **hydrogen** storage: **Magnesium** based composites **produced** by ball milling of powders.
Idruri metallici nanocristallini per immagazzinamento di idrogeno: Compositi a base magnesio prodotti tramite macinazione ad alta energia di polveri.

L49 ANSWER 11 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2
TI **Fuel** generator with diffusion ampoules for **fuel** cells

L49 ANSWER 12 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Storage, **generation**, and use of **hydrogen**

L49 ANSWER 13 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**

L49 ANSWER 14 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Storage, **generation**, and use of **hydrogen**

L49 ANSWER 15 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Low temperature sorbents for removal of sulfur compounds from fluid feed streams such as LPG and natural gas

L49 ANSWER 16 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Compositions for use in batteries, capacitors, **fuel** cells and similar devices and for **hydrogen production**

L49 ANSWER 17 OF 34 METADEX COPYRIGHT 2004 CSA on STN

TI Modern Concepts of Conversion and Storage of **Energy** by Dispersed Materials Absorption.

L49 ANSWER 18 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Method of **hydrogen generation** for **fuel** cell applications and a **hydrogen-generating** system

L49 ANSWER 19 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI **Generation** of **hydrogen** for use in **fuel** cell involves heating **hydrogen-producing** material containing a mixture of at least two types of hydrides.

L49 ANSWER 20 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Propellant

L49 ANSWER 21 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Apparatus for converting **energy.**

L49 ANSWER 22 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Production** of **hydrogen** gas from novel chemical **hydrides**

L49 ANSWER 23 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Gas-generating mixture for airbags

L49 ANSWER 24 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Dense **hydrogen** and oxygen sources for **fuel** cells

L49 ANSWER 25 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Performance-oriented packaging standards; changes to classification, hazard communication, packaging and handling requirements based on UN standards and agency initiative

L49 ANSWER 26 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Solid **hydrogen**/deuterium gas **generators**

L49 ANSWER 27 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Hydrogen energy** releasing catalyst

L49 ANSWER 28 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Compsn. for **generating hydrogen** or its isotopes - comprising mixture of metal hydride with inorganic ammonium or hydrazinium salt.

L49 ANSWER 29 OF 34 COMPENDEX COPYRIGHT 2004 EEI on STN
TI **HYDROGEN** AS A FUTURE EM DASH **ENERGY** ALTERNATIVE.

L49 ANSWER 30 OF 34 COMPENDEX COPYRIGHT 2004 EEI on STN DUPLICATE 3
TI PROPERTIES AND APPLICATIONS OF METAL HYDRIDES IN **ENERGY** CONVERSION SYSTEMS.

L49 ANSWER 31 OF 34 METADEX COPYRIGHT 2004 CSA on STN

TI Hydrides for **Energy** Storage.

L49 ANSWER 32 OF 34 COMPENDEX COPYRIGHT 2004 EEI on STN
TI ON THE STORAGE OF SOLHYDROGEN.

L49 ANSWER 33 OF 34 COMPENDEX COPYRIGHT 2004 EEI on STN
TI WHY A **HYDROGEN** ECONOMY?.

L49 ANSWER 34 OF 34 JAPIO (C) 2004 JPO on STN
TI **PRODUCTION** OF **HYDROGEN** STORAGE ALLOY

=> d all 1-34 149
YOU HAVE REQUESTED DATA FROM FILE 'JAPIO, METADEX, COMPENDEX, WPIX, CAPLUS' -
CONTINUE? (Y)/N:y

L49 ANSWER 1 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2004:252051 CAPLUS
DN 140:256336
ED Entered STN: 26 Mar 2004
TI Method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies
IN Eshraghi, Ray R.; Lin, Jung-chou; Lin, Changqing; Riley, Michael W.; Yarbrough, Erik K.
PA USA
SO U.S. Pat. Appl. Publ., 55 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01M004-86
ICS H01M008-10; H01M004-88; H01M004-92
NCL 429040000; 429042000; 429033000; 502101000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 56
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004058224	A1	20040325	US 2002-253371	20020924
PRAI	US 2002-253371		20020924		

AB This invention relates to a microfibrous **fuel** cell having at least one high quality electrocatalyst layer of a dual-layer structure, i.e., a catalyst layer comprising a catalytic material, and an interfacial composition layer comprising a mixture of catalytic material and electrolyte medium. The high quality electrocatalyst layer can be formed by various catalyzation methods, including diffusion catalyzation, ion-exchange catalyzation, electrodeposition catalyzation, impregnation catalyzation, chemical deposition catalyzation, and alternating catalyst/electrolyte addition catalyzation. The present invention also relates to a **fuel** cell assembly comprising multiple such microfibrous **fuel** cells bundled together, and methods for in situ catalyzation of such

fuel cell assembly to form high quality electrocatalyst layers of such dual-layer structure.

ST microfibrous **fuel** cell assembly fabrication

IT Alcohols, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(C1-8, solvent; method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT Diffusion
Electrodeposition
Impregnation
Ion exchange
(catalyzation; method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT Coating process
(chemical deposition, catalyzation; method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT Catalysts
(electrocatalysts; method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine- and sulfo-containing, ionomers, hollow fibers; method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT Fibers
RL: DEV (Device component use); USES (Uses)
(hollow, membranes; method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT Group VA element compounds
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(hypophosphites, reducing agent; method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT Polymers, uses
RL: DEV (Device component use); USES (Uses)
(ion-exchange; method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT **Fuel** cell separators
Solid state **fuel** cells
(method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT Alloys, uses
RL: CAT (Catalyst use); USES (Uses)
(method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT Polysulfones, uses
RL: DEV (Device component use); USES (Uses)
(method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT Carboxylic acids, uses
RL: DEV (Device component use); USES (Uses)
(perfluoro, polymers; method of fabrication of microfibrous

fuel cells and **fuel** cell assemblies)

IT Sulfonic acids, uses
RL: DEV (Device component use); USES (Uses)
(perfluorosulfonic acid polymers; method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, hollow fibers; method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT Ionomers
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing, hollow fibers; method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(sulfo-containing, perfluoro; method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT platinum alloy, base
RL: CAT (Catalyst use); USES (Uses)
(method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-33-7, Tungsten, uses 7440-57-5, Gold, uses 12623-53-9 12779-05-4 50942-39-7 51402-57-4 60501-15-7 467421-01-8
RL: CAT (Catalyst use); USES (Uses)
(method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT 14854-54-7, Potassium pentachloronitrosylruthenate(III) 14898-67-0, Ruthenium trichloride hydrate 16921-30-5, Dipotassium hexachloroplatinate 16941-12-1, Hexachloroplatinic acid 38386-99-1, Dipotassium pentachlororuthenate(2-)
RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses 7440-32-6, Titanium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7631-86-9, Silica, uses 9003-55-8, Butadiene-styrene copolymer 13463-67-7, Titania, uses 18282-10-5, Stannic oxide 56619-18-2, Styrene-vinylbenzenesulfonic acid copolymer
RL: DEV (Device component use); USES (Uses)
(method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

IT 50-00-0, Formaldehyde, processes 62-55-5, Thioacetamide 62-56-6, Thiourea, processes 64-18-6, Formic acid, processes 75-07-0, Acetaldehyde, processes 123-31-9, Hydroquinone, processes 123-38-6, Propionaldehyde, processes 302-01-2, Hydrazine, processes

676-58-4, Methyl magnesium chloride **1333-74-0**, **Hydrogen, processes** 7772-98-7, Sodium thiosulfate 7803-49-8, Hydroxylamine, processes 10294-66-3, Potassium thiosulfate 13774-81-7 **16853-85-3**, Lithium aluminum hydride 16940-66-2, Sodium borohydride
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(reducing agent; method of fabrication of microfibrous **fuel** cells and **fuel** cell assemblies)

L49 ANSWER 2 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2004:286750 CAPLUS
DN 140:306193
ED Entered STN: 08 Apr 2004
TI Alkali metal or alkaline earth metal borohydride and an oxidizing salt based on ammonium, alkali metal or alkaline earth metal perchlorate containing solid compositions for **generating hydrogen** by combustion
IN Desgardin, Nancy; Perut, Christian; Renouard, Jo L.
PA SNPE, Fr.
SO Eur. Pat. Appl., 11 pp.
CODEN: EPXXDW
DT Patent
LA French
IC ICM C01B003-06
ICS C06B047-10; C06D005-06; H01M008-06
CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 51, 52
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1405824	A2	20040407	EP 2003-292234	20030911
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
	FR 2845377	A1	20040409	FR 2002-12312	20021004
	US 2004065865	A1	20040408	US 2003-655303	20030905
PRAI	FR 2002-12312	A	20021004		

AB The compns. contain lithium borohydride and/or sodium borohydride and/or magnesium borohydride mixed with a perchlorate salt (e.g., ammonium perchlorate, sodium perchlorate or potassium perchlorate) in a ratio of 1:10. The solid decomposable compds. **generate hydrogen** by a self-sustaining **auto**-oxidation initiated by heat and are especially suitable for **fuel** cell use.
ST **hydrogen generating** compd borohydride perchlorate
IT **Fuel** cells
(alkali metal or alkaline earth metal borohydride and strontium nitrate containing solid compns. for **generating hydrogen** by combustion)
IT Perchlorates
RL: RCT (Reactant); RACT (Reactant or reagent)
(alkali metal or alkaline earth metal; alkali metal or alkaline earth metal borohydride and strontium nitrate containing solid compns. for

generating hydrogen by combustion)

IT Alkali metals, reactions
Alkaline earth metals
RL: RCT (Reactant); RACT (Reactant or reagent)
(borohydrides; alkali metal or alkaline earth metal borohydride and strontium nitrate containing solid compns. for **generating hydrogen** by combustion)

IT **1333-74-0P**, **Hydrogen**, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(alkali metal or alkaline earth metal borohydride and strontium nitrate containing solid compns. for **generating hydrogen** by combustion)

IT 7601-89-0, Sodium perchlorate 7778-74-7, Potassium perchlorate 7790-98-9, Ammonium perchlorate 10042-76-9, Strontium nitrate **16903-37-0**, Magnesium tetrahydroborate 16940-66-2, Sodium borohydride **16949-15-8**, Lithium borohydride
RL: RCT (Reactant); RACT (Reactant or reagent)
(alkali metal or alkaline earth metal borohydride and strontium nitrate containing solid compns. for **generating hydrogen** by combustion)

L49 ANSWER 3 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2004:286748 CAPLUS
DN 140:306192
ED Entered STN: 08 Apr 2004
TI Alkali metal or alkaline earth metal borohydride and strontium nitrate containing solid compositions for **generating hydrogen** by combustion
IN Desgardin, Nancy; Perut, Christian; Renouard, Joel
PA SNPE, Fr.
SO Eur. Pat. Appl., 9 pp.
CODEN: EPXXDW
DT Patent
LA French
IC ICM C01B003-06
ICS C06D005-06; H01M008-06; C06B047-10
CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 51, 52
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1405823	A2	20040407	EP 2003-292233	20030911
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
	FR 2845376	A1	20040409	FR 2002-12313	20021004
	US 2004065395	A1	20040408	US 2003-659306	20030911
	JP 2004123532	A2	20040422	JP 2003-347143	20031006
PRAI	FR 2002-12313	A	20021004		

AB The compns. contain lithium borohydride and/or sodium borohydride and/or magnesium borohydride mixed with strontium nitrate in a ratio of 1:10. The solid decomposable compds. **generate hydrogen** by a self-sustaining **auto**-oxidation initiated by heat and are especially

suitable for **fuel** cell use.
ST **hydrogen generating** compd borohydride strontium nitrate
IT **Fuel** cells
(alkali metal or alkaline earth metal borohydride and strontium nitrate containing solid compns. for **generating hydrogen** by combustion)
IT Alkali metals, reactions
Alkaline earth metals
RL: RCT (Reactant); RACT (Reactant or reagent)
(borohydrides; alkali metal or alkaline earth metal borohydride and strontium nitrate containing solid compns. for **generating hydrogen** by combustion)
IT **1333-74-0P, Hydrogen**, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(alkali metal or alkaline earth metal borohydride and strontium nitrate containing solid compns. for **generating hydrogen** by combustion)
IT 10042-76-9, Strontium nitrate **16903-37-0**, Magnesium tetrahydroborate 16940-66-2, Sodium borohydride **16949-15-8**, Lithium borohydride
RL: RCT (Reactant); RACT (Reactant or reagent)
(alkali metal or alkaline earth metal borohydride and strontium nitrate containing solid compns. for **generating hydrogen** by combustion)

L49 ANSWER 4 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:97792 CAPLUS
DN 138:140094
ED Entered STN: 07 Feb 2003
TI **Hydrogen** release at ambient temperature from aluminum-based hydride materials by mechanical treatment in the presence of a catalyst
IN Pecharsky, Vitalij K.; Balema, Viktor P.
PA Iowa State University Research Foundation, Inc., USA
SO U.S. Pat. Appl. Publ., 14 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM C01B003-04
NCL 423658200
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49, 67
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 2003026757	A1	20030206	US 2002-167556	20020612
PRAI US 2001-309668P	P	20010802		

AB **Hydrogen** stored in solid aluminum-based **hydrides** can be released at ambient temperature by mech. treatment, such as ball-milling, in the presence of titanium or iron as a catalyst. The solid hydride has the general formula: M'xMy(AlHn)z wherein M' is Li, Na, or K, M is Mg, Ca, Sr, or Ba, x is 0 or 1, yr is an integer between 0 and 3, z is an integer

between 1 and 7, and n is an integer between 3 and 6. The solid hydride can be LiAlH4, NaAlH4, Mg(AlH4)2, or AlH3. The **hydrogen** is supplied to **fuel** cells for the generation of elec. **energy** for **motor** vehicles.

ST **hydrogen** storage release aluminum hydride milling catalyst **fuel** cell

IT Power
(**generation**; **hydrogen** release at ambient temperature from aluminum-based hydride materials by mech. treatment in presence of catalyst)

IT Ball milling
Fuel cells
(**hydrogen** release at ambient temperature from aluminum-based hydride materials by mech. treatment in presence of catalyst)

IT 7439-89-6, Iron, uses 12004-78-3, Aluminum titanium al3ti
RL: CAT (Catalyst use); USES (Uses)
(**hydrogen** release at ambient temperature from aluminum-based hydride materials by mech. treatment in presence of catalyst)

IT 7550-45-0, Titanium tetrachloride, uses
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(**hydrogen** release at ambient temperature from aluminum-based hydride materials by mech. treatment in presence of catalyst)

IT 7784-21-6, Aluminum hydride (AlH3) 13770-96-2, Aluminum sodium hydride (AlNaH4) **16853-85-3** **30472-12-9**, Aluminum **magnesium hydride** (Al2MgH8)
RL: RCT (Reactant); RACT (Reactant or reagent)
(**hydrogen** release at ambient temperature from aluminum-based hydride materials by mech. treatment in presence of catalyst)

IT **1333-74-0P**, **Hydrogen**, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(**hydrogen** release at ambient temperature from aluminum-based hydride materials by mech. treatment in presence of catalyst)

L49 ANSWER 5 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:42998 CAPLUS
DN 138:94156
ED Entered STN: 17 Jan 2003
TI Oxidation treatment of clay raw materials containing pyrite for decreased sulfur content, less efflorescence and shorter firing time.
IN Brosnan, Denis A.; Frederic, James C.; Sanders, John P.
PA USA
SO U.S. Pat. Appl. Publ., 7 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM C04B033-00
ICS C04B014-04; C09C001-02; B28B001-00
NCL 501141000; 501145000; 501147000; 501148000; 106486000; 106468000; 264680000; 252186210; 252186220; 252186230
CC 57-5 (Ceramics)
Section cross-reference(s): 58

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003013599	A1	20030116	US 2001-901167	20010709
	US 6548438	B2	20030415		
	WO 2003006398	A1	20030123	WO 2002-US19936	20020624

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRAI US 2001-901167 A 20010709

AB A method of forming bricks, tiles, and the like by treating clay, shale or other clay ceramic raw materials containing pyrite is disclosed. Such clay ceramic raw materials may be ground, and then mixed with an oxidizer in a pre-oxidation step to disperse the oxidizer within the clay to expose the maximum amount of clay surface to the oxidizer. One oxidizer that may be used is an aqueous solution of **hydrogen** peroxide. Clay is shaped into clay products and then heated to elevated temps. Pyrite within the clay is oxidized, thereby removing sulfur-containing compds. such as sulfur dioxide from the clay. The application of the invention may assist in preventing efflorescence by ensuring complete or nearly complete removal of pyrite from products oxidation treatment and subsequent firing at elevated temps. Similarly, by enhancing the oxidation of pyrite, faster firing cycles may be possible which facilitates reduced **fuel** consumption and faster process time.

ST oxidn clay raw material pyrite sulfur removal ceramic manuf; **hydrogen** peroxide oxidn clay raw material pyrite sulfur removal

IT Clays, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(ball clays, starting material; oxidation treatment of pyrite-containing clay raw materials for decreased sulfur content, efflorescence and firing time)

IT Bricks
Tiles
(clay ceramic; oxidation treatment of pyrite-containing clay raw materials for decreased sulfur content, efflorescence and firing time)

IT Ceramics
(clay; oxidation treatment of pyrite-containing clay raw materials for decreased sulfur content, efflorescence and firing time)

IT Size reduction
(of clay raw materials; oxidation treatment of pyrite-containing clay raw materials for decreased sulfur content, efflorescence and firing time)

IT Carboxylic acids, processes
RL: CPS (Chemical process); MOA (Modifier or additive use); PEP (Physical,

engineering or chemical process); PROC (Process); USES (Uses)
(oxidizing agent; oxidation treatment of pyrite-containing clay raw materials
for decreased sulfur content, efflorescence and firing time)

IT Oxidation
Oxidizing agents
(oxidation treatment of pyrite-containing clay raw materials for decreased sulfur content, efflorescence and firing time)

IT Raw materials
(pyrite-containing clays; oxidation treatment of pyrite-containing clay raw materials for decreased sulfur content, efflorescence and firing time)

IT Clays, processes
Kaolin, processes
Shale
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(starting material; oxidation treatment of pyrite-containing clay raw materials for decreased sulfur content, efflorescence and firing time)

IT Firing (heat treating)
(time; oxidation treatment of pyrite-containing clay raw materials for decreased sulfur content, efflorescence and firing time)

IT 1309-36-0, Pyrite, processes 12068-85-8, Iron sulfide (FeS2)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(in clay raw materials; oxidation treatment of pyrite-containing clay raw materials for decreased sulfur content, efflorescence and firing time)

IT 77-92-9, Citric acid, processes 1303-96-4, Borax 1304-29-6, Barium peroxide 1313-60-6, Sodium peroxide 3811-04-9, Potassium chlorate 7631-99-4, Sodium nitrate, processes 7632-04-4, Sodium perborate 7646-69-7, Sodium hydride 7722-84-1, **Hydrogen** peroxide (H2O2), **processes** 7757-79-1, Potassium nitrate, processes 7758-19-2, Sodium chlorite 7778-54-3, Calcium hypochlorite 7789-78-8, Calcium hydride 7790-98-9, Ammonium perchlorate 10022-31-8, Barium nitrate 10028-15-6, Ozone, processes **10034-81-8**, Magnesium perchlorate 10124-31-9, Ammonium phosphate 15630-89-4, Sodium percarbonate **16853-85-3**, Lithium aluminum hydride
RL: CPS (Chemical process); MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(oxidizing agent; oxidation treatment of pyrite-containing clay raw materials
for decreased sulfur content, efflorescence and firing time)

IT 7446-09-5, Sulfur dioxide, processes
RL: FMU (Formation, unclassified); REM (Removal or disposal); FORM (Formation, nonpreparative); PROC (Process)
(oxidation treatment of pyrite-containing clay raw materials for decreased sulfur content, efflorescence and firing time)

IT 1318-93-0, Montmorillonite, processes **12173-60-3**, Illite
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(starting material; oxidation treatment of pyrite-containing clay raw materials for decreased sulfur content, efflorescence and firing time)

L49 ANSWER 6 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:42623 CAPLUS
DN 138:76108
ED Entered STN: 17 Jan 2003
TI Differential pressure-driven borohydride based **generator** for **hydrogen**
IN Amendola, Steven C.; Mohring, Richard M.; Petillo, Phillip J.; Fennimore, Keith A.
PA Millennium Cell, Inc., USA
SO U.S. Pat. Appl. Publ., 18 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM B01J007-00
ICS C10J001-00
NCL 048061000
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 2003009942	A1	20030116	US 2001-902899	20010711
WO 2003006150	A1	20030123	WO 2002-US18805	20020614

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

EP 1414559	A1	20040506	EP 2002-739875	20020614

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

PRAI US 2001-902899 A 20010711
WO 2002-US18805 W 20020614
AB An arrangement for **generating hydrogen** gas utilizes differential pressure to transport **fuel** and spent **fuel** components without requiring an elec. powered **fuel** delivery pump. The arrangement comprises: (a) a catalyst chamber comprising a catalyst, (b) a **fuel** chamber comprising a reactant material capable of generating H gas when contacting the catalyst, (c) a spent **fuel** chamber connected to the catalyst chamber for receiving the reactant material after contacting the catalyst and for receiving H gas generated by contacting the reactant material and the catalyst, (d) a conduit between the spent **fuel** chamber and **fuel** chamber, the conduit including a check valve, and (e) an outlet conduit connected connected to the check valve.
ST **hydrogen generator** differential pressure driven borohydride based
IT Catalysts

Fuels
Pressure relief valves
(differential pressure-driven borohydride based **generator** for **hydrogen**)

IT Transition metal alloys
Transition metal borides
Transition metals, uses
RL: CAT (Catalyst use); USES (Uses)
(differential pressure-driven borohydride based **generator** for **hydrogen**)

IT 13762-51-1, Potassium borohydride 16883-45-7, Borate(1-), tetrahydro-, tetramethylammonium **16903-37-0**, Borate(1-), tetrahydro-, Magnesium 16940-66-2, Sodium borohydride **16949-15-8**, Lithium borohydride 17068-95-0, Borate(1-), tetrahydro-, calcium 19193-35-2, Borate(1-), tetrahydro-, ammonium
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(differential pressure-driven borohydride based **generator** for **hydrogen**)

IT **1333-74-0P**, **Hydrogen**, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(differential pressure-driven borohydride based **generator** for **hydrogen**)

IT 1310-73-2, Sodium hydroxide, uses
RL: MOA (Modifier or additive use); USES (Uses)
(differential pressure-driven borohydride based **generator** for **hydrogen**)

L49 ANSWER 7 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:969454 CAPLUS
DN 140:7208
ED Entered STN: 12 Dec 2003
TI Accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solutions for **fuel** cells
IN Tsang, Joseph W.
PA Hewlett-Packard Development Company, L.P., USA
SO Eur. Pat. Appl., 9 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01M008-06
ICS C01B003-06
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI EP 1369947	A2	20031210	EP 2003-253298	20030527
EP 1369947	A3	20040428		

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,

IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK

US 2003228505	A1	20031211	US 2002-165370	20020606	
JP 2004014515	A2	20040115	JP 2003-162284	20030606	
PRAI US 2002-165370	A	20020606			

AB A proton-exchange-membrane **fuel** cell has as its **hydrogen** source the transition metal catalyzed decomposition of NaBH4 in aqueous alkaline solution that is characterized by the mixing of two solns. consisting of: (1) a first aqueous alkaline solution containing 5-50 weight%. of an alkali metal borohydride (preferably NaBH4) and 5-40 weight% alkali hydroxide or alkaline earth metal hydroxide, and (2) a second solution consisting of 51-100 weight% water that optionally contains water-soluble additives (e.g., surfactants, pH-adjusting agents, etc.). The transition metal is selected from Groups IB to VIII metals. Suitable surfactants include C1-10-alcs., ethylene glycol and oligomers, C3-20-diols and triols, nonionic surfactants, mineral acids, alkyl and aryl carboxylic acids, alkyl and aryl sulfonic acids, alkyl and aryl phosphoric acids, and α-hydroxy acids. Hydrolysis of NaBH4 **produces H2** and NaBO2 (as various hydrates). Such a reaction method **produces** not only **H2 fuel** for the **fuel** cell but also provides for stable long-term storage of aqueous NaBH4 and rapid decomposition upon mixing.

ST sodium borohydride hydrolysis **hydrogen fuel** cell; transition metal catalyzed hydrolysis sodium borohydride **fuel** cell

IT Alcohols, uses
RL: NUU (Other use, unclassified); USES (Uses)
(C1-10, reaction aid; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT Alcohols, uses
RL: NUU (Other use, unclassified); USES (Uses)
(C11-15-secondary, ethoxylated, reaction aid; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT Glycols, uses
RL: NUU (Other use, unclassified); USES (Uses)
(C3-20, reaction aid; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT Carboxylic acids, uses
RL: NUU (Other use, unclassified); USES (Uses)
(aliphatic, reaction aid; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT Sulfonic acids, uses
RL: NUU (Other use, unclassified); USES (Uses)
(alkanesulfonic, reaction aid; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT Sulfonic acids, uses
RL: NUU (Other use, unclassified); USES (Uses)

(arenesulfonic, reaction aid; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT Carboxylic acids, uses
RL: NUU (Other use, unclassified); USES (Uses)
(aromatic, reaction aid; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT Transition metals, uses
RL: CAT (Catalyst use); USES (Uses)
(decomposition catalysts; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT Decomposition catalysts
(for borohydride decomposition; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT Group IB elements
Group IIB elements
Group IIIB elements
Group IVB elements
Group VB elements
Group VIB elements
Group VIIB elements
RL: CAT (Catalyst use); USES (Uses)
(for borohydride decomposition; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT Carboxylic acids, uses
RL: NUU (Other use, unclassified); USES (Uses)
(hydroxy, reaction aid; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT Alkali metal hydroxides
Alkaline earth hydroxides
RL: RCT (Reactant); RACT (Reactant or reagent)
(in mixing solns.; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT Surfactants
(nonionic, reaction aid; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT **Fuel** cells
(proton-exchange membrane-type; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT Alcohols, uses
RL: NUU (Other use, unclassified); USES (Uses)
(trihydric, C3-20, reaction aid; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT 13762-51-1, Potassium borohydride 16940-66-2, Sodium borohydride **16949-15-8**, Lithium borohydride 16971-29-2D, Borate(1-), tetrahydro, alkali metal salts
RL: RCT (Reactant); RACT (Reactant or reagent)
(accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT 7775-19-1, Sodium metaborate
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(aqueous hydrate solns.; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT 7440-18-8, Ruthenium, uses
RL: CAT (Catalyst use); USES (Uses)
(for borohydride decomposition; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT 1305-62-0, Calcium hydroxide, reactions **1309-42-8**, Magnesium hydroxide 1310-58-3, Potassium hydroxide, reactions **1310-65-2**, Lithium hydroxide 1310-73-2, Sodium hydroxide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(in mixing solns.; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT **1333-74-0P**, **Hydrogen**, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(in-situ formation of, for **fuel** cells; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

IT 64-19-7, Acetic acid, uses 77-92-9, Citric acid, uses 107-21-1, Ethylene glycol, uses 111-29-5, 1,5-Pentanediol 7647-01-0, Hydrochloric acid, uses 7664-38-2D, Phosphoric acid, derivs.
RL: NUU (Other use, unclassified); USES (Uses)
(reaction aid; accelerated **hydrogen generation** by reactive mixing of aqueous alkaline alkali metal borohydride solns. for **fuel** cells)

L49 ANSWER 8 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2003-522844 [49] WPIX
DNC C2003-140503
TI Electric power **generator** for e.g. electronic shelf label, comprises **fuel** cell with anode and cathode separated by proton exchange membrane(s), and **hydrogen generator** comprising catalyst and water based **fuel.**
DC L03
IN GOLDSTEIN, J R; ROSENFELD, O
PA (ELDA-N) ELDAT COMMUNICATION LTD
CYC 31
PI US 2003091878 A1 20030515 (200349)* 51 H01M008-06
EP 1318558 A2 20030611 (200349) EN H01M008-06
R: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR
ADT US 2003091878 A1 US 2001-14327 20011113; EP 1318558 A2 EP 2002-257847

20021113
PRAI US 2001-14327 20011113
IC ICM H01M008-06
ICS C01B003-06; G06F017-60; H01M004-92; H01M004-96; H01M008-10
AB US2003091878 A UPAB: 20030731
NOVELTY - An electric power **generator** comprises:
(i) a **fuel** cell including a **fuel** cell anode and a **fuel** cell cathode separated by at least one proton exchange membrane; and
(ii) a **hydrogen generator** that provides molecular **hydrogen** to the **fuel** cell anode, comprising a catalyst and employing a water based **fuel** including salts, bases or acids, as well as zinc, magnesium, iron or aluminum.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:
(a) an electronic shelf label comprising a display and an electrical power **generator** as above for the display;
(b) a method for electrical power **generation** comprising employing a **fuel** cell including a **fuel** cell anode and a **fuel** cell cathode separated by proton exchange membrane(s); and powering the **fuel** cell using a **hydrogen generator** as above;
(c) a method of operating an electronic shelf label including a display, comprising using a **fuel** cell as above; and powering the **fuel** cell using a **hydrogen generator** as above;
(d) a method for recharging an electric power **generator**, comprising providing an electric power **generator** as above; disconnecting the current controller from the anode and the cathode; replenishing water in the water-based **fuel**; providing a direct current (DC) **generator** and connecting the anode to a negative electrode of the DC current supply and connecting the cathode to a positive electrode of the DC current supply; and applying electric DC current from the electrodes of the DC current supply to the anode and cathodes of the electric power **generator**;
(e) a mechanism for recharging an electric power **generator** comprising an electric power **generator** as above; a DC current **generator** comprising a positive and a negative electrode; a mechanism for disconnecting the current controller from the anode and the cathode and connecting the anode to the negative electrode of the DC current supply and connecting the cathode to the positive electrode to the DC current **generator**; a mechanism for replenishing water in the water-based **fuel**; and a mechanism for applying electric DC current from the electrodes of the DC current supply to the anode and cathodes of the electric power **generator**;
(f) an electronic computing system, comprising processor and/or microprocessor; and an electric power **generator** as above;
(g) a method of operating an electronic computing system as above, comprising using a **fuel** cell as above; and powering the **fuel** cell using a **hydrogen generator** as above;
(h) an electronic mobile communication device, comprising a transmitter and/or a receiver; and an electrical power **generator** as above;
(i) a method of operating an electronic mobile communication device

as above, comprising using a **fuel** cell as above and powering the **fuel** cell using the **hydrogen generator** as above;

(j) a method of providing electrical power to an electronic mobile communication device;

(k) an electrically powered toy, comprising a toy; an electrically operated element; and an electrical power **generator** as above; and

(l) a method of operating an electrically operated toy, comprising providing a toy; providing an electrically operated element inside the toy; using a **fuel** cell as above; and powering the **fuel** cell using the **hydrogen generator** as above.

USE - As an electric power **generator** for an electronic shelf label, an electronic computing system, an electronic mobile communication device, or an electrically powered toy (claimed).

ADVANTAGE - The electric power **generator** has improved **fuel** cells and **hydrogen generators.**

DESCRIPTION OF DRAWING(S) - The figure shows a simplified exploded view pictorial illustration of a **fuel** cell and **hydrogen generator.**

Water-based **fuel** 104
Catalyst 106
Cathode 152
Anode 160
Dwg.1/23

FS CPI
FA AB; GI
MC CPI: L03-E04B; L03-E04F; L03-E04G

L49 ANSWER 9 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2003-765467 [72] WPIX
DNN N2003-613105 DNC C2003-210119
TI **Hydrogen**-fueled motor vehicle, e.g. car, includes **hydrogen**-fueled locomotion subsystem, and refuelable **hydrogen generator** comprising electrochemical reactor, and refueling subsystem.
DC E36 H06 L03 W06 X16 X21 X22 X23
IN GOLDSTEIN, J R; ROSENFELD, O; SANDLERMAN, N
PA (ELDA-N) ELDAT COMMUNICATION LTD
CYC 1
PI US 2003091503 A1 20030515 (200372)* 38 C01B003-08
ADT US 2003091503 A1 US 2001-14328 20011113
PRAI US 2001-14328 20011113
IC ICM C01B003-08
AB US2003091503 A UPAB: 20031107
NOVELTY - A **hydrogen**-fueled motor vehicle includes a **hydrogen**-fueled locomotion subsystem such as a **hydrogen** fuelled engine or a **fuel** cell and motor assembly, and a refuelable **hydrogen generator** supplying **hydrogen fuel** to the locomotion subsystem. The **hydrogen generator** (16) has electrochemical reactor **generating** the **hydrogen fuel** from water; and a

refueling subsystem providing water, electrolyte, **hydrogen**, metal containing material, and electrical power to the reactor.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for recharging the above **hydrogen**-fueled motor vehicle comprising providing **hydrogen**-fueled locomotion subsystem and a refuelable **hydrogen generator** comprising electrochemical reactor; and supplying water, electrolyte, **hydrogen**, metal containing material, and electrical power to the electrochemical reactor.

USE - Used as **hydrogen**-fueled motor vehicle (10), e.g. car, train, or airplane.

ADVANTAGE - The cathode operates as a **hydrogen-generating** cathode when the **hydrogen generator generates hydrogen**, such that the **hydrogen generator** is recharging and the cathode operates as **hydrogen**-consumer. The **hydrogen** reaction causes a depleted anode to be reduced so that the original composition of the anode is reconstituted and water is **produced.** The **hydrogen generator** may be operated by different methods to enable electrical charging at home and anode replacement or slurry **fuel** replenishment in a recharging section.

DESCRIPTION OF DRAWING(S) - The figure illustrates the refuelable **hydrogen**-fueled vehicle and its **hydrogen** recharging system.

Motor vehicle 10
Electrical motor 14
Hydrogen generator 16
Fuel cell 18
Solar cells 24
Dwg.1/15

FS CPI EPI
FA AB; GI; DCN
MC CPI: E11-N; E31-A02; H06-A03; L03-E04F; L03-H05
EPI: W06-B01C9; X16-C; X21-A01F; X21-B01A; X22-A03A; X22-A09; X22-A20E; X23-A01A

L49 ANSWER 10 OF 34 COMPENDEX COPYRIGHT 2004 EEI on STN DUPLICATE 1
AN 2003(46):5825 COMPENDEX
TI Nanocrystalline metallic **hydrides** for **hydrogen** storage: **Magnesium** based composites **produced** by ball milling of powders.
Idruri metallici nanocristallini per immagazzinamento di idrogeno: Compositi a base magnesio prodotti tramite macinazione ad alta energia di polveri.
AU Principi, G. (Dipartimento di Ingegneria Meccanica INFM Universita di Padova, Padova, Italy); Dal Toe, S.; Lo Russo, S.; Maddalena, A.; Saber, A.; Spataru, T.; Checchetto, R.; Miotello, A.; Tosello, C.
SO Metallurgia Italiana v 95 n 9 September 2003 2003.p 37-43
CODEN: MITLAC ISSN: 0026-0843
PY 2003
DT Journal
TC Theoretical; Experimental
LA Italian

AB A brief description is presented of problems concerning the realisation of **hydrogen** reservoirs for vehicles powered by on board **fuel** cells (fig.1). **Hydrogen** storage in the solid state, e. g. in hydrides, is recognised to be the best perspective and then the requisites for a metal hydride to be used with this purpose are discussed. The problems to be resolved in order to obtain a metal hydride interesting for applications concern both thermodynamics and kinetics of **hydrogen** absorption/desorption processes. The thermodynamics aspects for the formation of an hydride from a metal or an alloy and gaseous **hydrogen** are described by the pressure-composition isotherms (PCI) of fig.2a. These PCI curves are characterised by a plateau, for every given temperature, in correspondence to the equilibrium pressure at which **hydrogen** can be reversibly stored. The equilibrium pressure strongly depends on the enthalpy variations, according to the van't Hoff graph (fig.2b). When two or more hydrides are formed at a given temperature by sequential increase of the pressure, two or more plateaux will appear in the corresponding PCI diagram (fig.3). For an ideal hydride, working pressure and temperature should lie in the range 1-10 bar and 20-100 deg C, respectively, corresponding to enthalpy variations in the range of 15-24 kJ/molH. The process kinetics can be improved by particular treatments of the starting material such as ball milling (to greatly enhance the surface area and the density of structural defects) and by the addition of catalysts. Moreover, for on board applications, the weight ratio **hydrogen**/reservoir should be rather high, implying the use of hydrides of light metals (table I), as Mg. The problem with Mg is the very slow kinetics, which significantly improves by ball milling, and the high working temperature (about 300 deg C), as shown in figs.4 and 5, respectively. In this work preliminary results are reported on microstructural changes of magnesium hydride by ball milling treatment and on the effect of Nb addition on mechanisms and temperature of **hydrogen** desorption. Samples of commercial Mg H2 (Tab. II) have been milled with a Spex8000M mill and reacted with **hydrogen** in a Sievert apparatus (fig.6) by performing a number of desorption/absorption cycles until a maximum storage capacity is reached (activation). Structural characterisation of as received, milled and activated samples was performed by X-ray diffraction, fig. 7. After activation a significant increase of grain size and decrease of desorption temperature are observed in MgH2samples with Nb addition. The catalytic effect of Nb addition is also evidenced by the reduction of the number of activation cycles and by the lower temperature at which desorption starts, as measured by thermal desorption spectra, fig.8. Finally it is shown that when Nb is added the desorption kinetics is determined by the **hydrogen** recombination at the surface. 21 Refs.

CC 933.1 Crystalline Solids; 804 Chemical Products Generally; 802.3 Chemical Operations; 931.2 Physical Properties of Gases, Liquids and Solids; 802.2 Chemical Reactions; 801.4 Physical Chemistry

CT *Nanostructured materials; Powder metallurgy; Crystal microstructure; X ray diffraction analysis; Grain size and shape; Enthalpy; Adsorption isotherms; **Hydrogen**; Gas adsorption; Reaction kinetics; Hydrides; Composite materials; Ball milling

ST Thermal desorption spectra

ET H; I; Mg; Nb; H*Mg; MgH; Mg cp; cp; H cp

L49 ANSWER 11 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2
AN 2002:928086 CAPLUS
DN 137:387164
ED Entered STN: 06 Dec 2002
TI **Fuel** generator with diffusion ampoules for **fuel** cells
IN Hockaday, Robert G.; Turner, Patrick S.; Bradford, Zachary R.; Dejohn, Marc D.; Navas, Carlos J.; Uhrich, F. Wade; Vaz, Heathcliff L.; Vazul, L. Luke
PA USA
SO U.S. Pat. Appl. Publ., 17 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01M008-06
ICS B01J007-00; B01J016-00
NCL 429019000; 422236000; 422164000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 2002182459	A1	20021205	US 2001-870506	20010601
US 6645651	B2	20031111		
PRAI US 2001-870506		20010601		

AB A system of two **fuel** ampoules that can deliver a reactant by diffusion through one of the ampoule walls to the other, such that when the reactant enters the second ampoule, it reacts with another reactant in the second ampoule, making **hydrogen** gas as a **product.** Both ampoules are stored in a **fuel** impermeable container. These ampoules used with small low power **fuel** cells which need a steady controlled uniform delivery of vaporous **fuel** such **hydrogen** and alcs. This fueling system provides a simple safe **fuel** interactive system for small **hydrogen fuel** cells that prevents inadvertent **hydrogen production** by any single ampoule being exposed to water or typical consumer environments.
ST **fuel** cell **fuel** generator diffusion ampoule
IT Polymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(H-permeable; **fuel** generator with diffusion ampoules for **fuel** cells)
IT Metals, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(films, H-permeable; **fuel** generator with diffusion ampoules for **fuel** cells)
IT Ampuls
Fuel cells
Fuel gas manufacturing
Permeability
(**fuel** generator with diffusion ampoules for **fuel** cells)
IT **Hydrides**
Polysiloxanes, uses

Silicone rubber, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**fuel** generator with diffusion ampoules for **fuel** cells)

IT 50-00-0, Formaldehyde, uses 64-18-6, Formic acid, uses 64-19-7, Acetic acid, uses 67-56-1, Methanol, uses 124-38-9, Carbon dioxide, uses 7664-93-9, Sulfuric acid, uses
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**fuel** generator with diffusion ampoules for **fuel** cells)

IT **1333-74-0P, Hydrogen**, uses
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**fuel generator** with diffusion ampoules for **fuel** cells)

IT 7429-90-5, Aluminum, uses 7439-93-2, Lithium, uses 7440-09-7, Potassium, uses 7440-17-7, Rubidium, uses 7440-23-5, Sodium, uses 7440-70-2, Calcium, uses **7580-67-8, Lithium hydride** (LiH) 7646-69-7, Sodium hydride (NaH) 7693-26-7, Potassium hydride **7693-27-8, Magnesium hydride** 7789-78-8, Calcium hydride (CaH2) 13770-96-2, Sodium tetrahydroaluminate **16853-85-3** 16903-34-7, Potassium tetrahydroaluminate 16940-66-2, Sodium tetrahydroborate 16941-10-9, Calcium tetrahydroaluminate **16949-15-8**, Lithium tetrahydroborate **17300-62-8**, Magnesium tetrahydroaluminate
RL: TEM (Technical or engineered material use); USES (Uses)
(**fuel** generator with diffusion ampoules for **fuel** cells)

L49 ANSWER 12 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:658032 CAPLUS
DN 137:187737
ED Entered STN: 30 Aug 2002
TI Storage, **generation**, and use of **hydrogen**
IN Konduri, Ravi K.; Larsen, Christopher A.; McClaine, Andrew W.; Rolfe, Jonathan L.
PA Safe Hydrogen, LLC, USA
SO PCT Int. Appl., 34 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM C01B003-08
ICS C01B006-04; C01B006-24; B01J007-00
CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 52
FAN.CNT 2

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 2002066369	A1	20020829	WO 2002-US923	20020111

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,

CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

EP 1355849 A1 20031029 EP 2002-720786 20020111

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

PRAI US 1999-309198 A2 19990510

US 2000-707105 A2 20001106

US 2001-261600P P 20010112

US 2001-261601P P 20010112

US 2001-261616P P 20010112

WO 2002-US923 W 20020111

AB A composition comprising a carrier liquid (e.g., a hydrocarbon); a dispersant (e.g., a triglyceride); and a chemical hydride. The composition can be used in a **hydrogen generator** to **generate** **hydrogen** for use, e.g., as a **fuel.** A regenerator recovers elemental metal from byproducts of the **hydrogen** **generation process.**

ST **hydrogen** storage **generation** compn

IT **Combustion engines**
(external; storage, **generation**, and use of **hydrogen** for **fuel cells** or **engines**)

IT Power
(generation; storage, **generation**, and use of **hydrogen** for **fuel cells** or **engines**)

IT **Fuel cells**
Internal **combustion engines**
(storage, **generation**, and use of **hydrogen** for **fuel cells** or **engines**)

IT Alkanes, uses
Hydrocarbon **oils**
Hydrocarbons, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(storage, **generation**, and use of **hydrogen** for **fuel cells** or **engines**)

IT **122-32-7**, Oleic acid triglyceride
RL: MOA (Modifier or additive use); USES (Uses)
(dispersant; storage, **generation**, and use of **hydrogen** for **fuel cells** or **engines**)

IT **1333-74-0, Hydrogen, processes**
7580-67-8, Lithium hydride 7646-69-7, Sodium hydride **7693-27-8, Magnesium hydride** 7789-78-8, Calcium hydride 13770-96-2, Sodium aluminum hydride **16853-85-3**, Lithium aluminum hydride 16940-66-2, Sodium borohydride **16949-15-8**, Lithium borohydride

RL: CPS (Chemical process); EPR (Engineering process); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(storage, **generation**, and use of **hydrogen** for **fuel cells** or **engines**)

IT 109-66-0, Pentane, uses 110-54-3, Hexane, uses 630-08-0, Carbon monoxide, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(storage, **generation**, and use of **hydrogen** for **fuel cells** or **engines**)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Bailey; US 4261955 A 1981 CAPLUS
(2) Bloomfield; US 3649360 A 1972 CAPLUS
(3) Creger; US 3759986 A 1973 CAPLUS
(4) Erickson; US 3975913 A 1976
(5) Joshi; US 5707499 A 1998 CAPLUS
(6) Klanchar; US 5867978 A 1999
(7) Mackenzie; US 3674702 A 1972 CAPLUS
(8) Ueno; US 5468880 A 1995 CAPLUS

L49 ANSWER 13 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:31598 CAPLUS
DN 136:88216
ED Entered STN: 11 Jan 2002
TI Organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**
IN Haenel, Matthias Walter; Narangerel, Janchig; Richter, Udo-Burckhard; Rufinska, Anna
PA Studiengesellschaft Kohle m.b.H., Germany
SO PCT Int. Appl., 38 pp.
CODEN: PIXXD2
DT Patent
LA German
IC ICM C10G001-08
CC 51-21 (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 29

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002002719	A1	20020110	WO 2001-EP7589	20010703
	W: AU, CA, JP, US, ZA				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
	DE 10032316	A1	20020117	DE 2000-10032316	20000704
	AU 2001085793	A5	20020114	AU 2001-85793	20010703
PRAI	DE 2000-10032316	A	20000704		
	WO 2001-EP7589	W	20010703		

OS MARPAT 136:88216
AB Hydroliquefaction of coal is carried out at 1-100 MPa **H2** and 140-500° in the presence of diorganohaloboranes (R2BX), organodihaloboranes (RBX2), or dihalohydroboranes (HBX2) catalysts to hydrogenated products (R = alkyl, aryl, benzyl, and aralkyl; X = F, Cl,

Br, I). The haloboranes are easily formed in-situ under the reaction conditions from a halogenation agent and: (1) organoboranes (R3B), (R2BH)2, (R2BH)2, (RBH2)2, or diborane (BH3)2, or (2) metal organoborates, of structures M+[R4B]-, M+[R3BH]- M+[R2BH2]- M+[RBH3]- or M+[BH4]- (M = Li, Na, K, Cs, Rb, 1/2Mg, 1/2Ca, 1/2Sr, 1/2 Ba, 1/2Zn). Halogenation agents include elementary halogen, X2 (X = Cl, Br, I), **hydrogen** halides (HX), boron trihalides (BX3), titanium tetrahalides (TiX4), tin tetrahalides (SnX4), antimony trihalides (SbX3), phosphorus pentahalide (PX5), or antimony pentahalides (SbX5). Suitable feedstocks include coal (with ranks between high-volatile bituminous and anthracite), heavy oils, petroleum distillation residues, tar sands, or oil shale, in which the raw **fuels** are ground or pulverized and then dispersed or suspended in liquid aliphatic, aromatic, or hydroarom. solvents (e.g., benzene, toluene, xylene, trimethylbenzenes, and alkyl-, dialkyl-, and trialkylbenzenes).

ST borane haloborane organoborane coal liquefaction catalyst; metal borohydride halogenation coal liquefaction catalyst; petroleum residue hydrogenation borane organoborane halogenation

IT Alkali metal **hydrides**
RL: RCT (Reactant); RACT (Reactant or reagent)
(Group IIIA element **hydrides**, halogenation agents; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Halogenation
(agents; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Group IIIA element compounds
RL: RCT (Reactant); RACT (Reactant or reagent)
(alkali metal **hydrides**, halogenation agents; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Group VA element compounds
Halides
RL: RCT (Reactant); RACT (Reactant or reagent)
(antimony halides, halogenation agents; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Rare earth salts
Transition metal salts
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(borohydride and organoborohydride derivs., reaction products with halogenation agents, catalysts; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Group IIIA element compounds
Halides
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(boron halides, organo derivs., catalysts; organoborane-metal

borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Petroleum refining residues
(distillation, hydrogenation-hydrogenolysis of; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Alkaline earth compounds
RL: RCT (Reactant); RACT (Reactant or reagent)
(**hydrides**, Group IIIA element **hydrides**; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Oil sand
Shale oils
(hydrogenation-hydrogenolysis of; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Petroleum refining catalysts
(hydrogenation-hydrogenolysis; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Boranes
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(organo, reaction products with halogenation agents, catalysts; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Coal liquefaction catalysts
Hydrogenation catalysts
Hydrogenolysis catalysts
(organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Group VIA element compounds
RL: RCT (Reactant); RACT (Reactant or reagent)
(phosphorus halides, halogenation agents; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Halides
Hydrogen halides
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(reaction **products** with organoboranes; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Group IVA element compounds
Halides

RL: RCT (Reactant); RACT (Reactant or reagent)
(tin halides, halogenation agents; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT Transition metal halides
RL: RCT (Reactant); RACT (Reactant or reagent)
(titanium halides, halogenation agents; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT 7429-91-6D, Dysprosium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7439-88-5D, Iridium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7439-89-6D, Iron, ions, borohydride and organoborohydride derivs., reaction products with halogenation agents, uses 7439-91-0D, Lanthanum, borohydride and organoborohydride derivs., reaction products with halogenation agents 7439-94-3D, Lutetium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7439-96-5D, Manganese, ions, borohydride and organoborohydride derivs., reaction products with halogenation agents, uses 7439-97-6D, Mercury, borohydride and organoborohydride derivs., reaction products with halogenation agents 7439-98-7D, Molybdenum, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-00-8D, Neodymium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-02-0D, Nickel, ions, borohydride and organoborohydride derivs., reaction products with halogenation agents, uses 7440-03-1D, Niobium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-04-2D, Osmium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-05-3D, Palladium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-06-4D, Platinum, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-10-0D, Praseodymium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-12-2D, Promethium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-15-5D, Rhenium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-16-6D, Rhodium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-18-8D, Ruthenium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-19-9D, Samarium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-20-2D, Scandium, ions, borohydride and organoborohydride derivs., reaction products with halogenation agents, uses 7440-22-4D, Silver, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-25-7D, Tantalum, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-27-9D, Terbium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-30-4D, Thulium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-32-6D, Titanium, ions, borohydride and organoborohydride derivs., reaction products with halogenation agents, uses 7440-33-7D, Tungsten, borohydride and

organoborohydride derivs., reaction products with halogenation agents 7440-43-9D, Cadmium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-45-1D, Cerium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-47-3D, Chromium, ions, borohydride and organoborohydride derivs., reaction products with halogenation agents, uses 7440-48-4D, Cobalt, ions, borohydride and organoborohydride derivs., reaction products with halogenation agents, uses 7440-50-8D, Copper, ions, borohydride and organoborohydride derivs., reaction products with halogenation agents, uses 7440-53-1D, Europium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-54-2D, Gadolinium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-57-5D, Gold, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-58-6D, Hafnium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-60-0D, Holmium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-62-2D, Vanadium, ions, borohydride and organoborohydride derivs., reaction products with halogenation agents, uses 7440-64-4D, Ytterbium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-65-5D, Yttrium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-65-5D, Yttrium, ions, borohydride and organoborohydride derivs., reaction products with halogenation agents, uses 7440-66-6D, Zinc, borohydride and organoborohydride derivs., reaction products with halogenation agents 7440-67-7D, Zirconium, borohydride and organoborohydride derivs., reaction products with halogenation agents 7550-45-0, Titanium tetrachloride, uses 7553-56-2, Iodine, uses 7726-95-6, Bromine, uses 7782-50-5D, Chlorine, reaction products with organoboranes or metal borohydrides 7789-68-6D, Titanium tetrabromide, reaction products with tetrapropyldiborane 13762-51-1, Potassium borohydride **16903-37-0**, Borate(1-), tetrahydro-, magnesium (2:1) 16940-66-2, Sodium borohydride **16949-15-8D**, Lithium borohydride, reaction products with halogenation agents 17068-95-0, Calcium borohydride 17611-70-0, Zinc borohydride 19193-36-3, Cesium borohydride 20346-99-0, Rubidium borohydride 22086-51-7D, Borane, iododipropyl-, reaction products with iodine 22784-01-6D, Tetrapropyldiborane, reaction products with iodine 42749-59-7, Strontium borohydride 52151-42-5, Barium borohydride
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(catalysts; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

IT 71-43-2, Benzene, uses 71-43-2D, Benzene, alkyl derivs. 108-88-3, Toluene, uses 1330-20-7, Xylene, uses 25551-13-7, Trimethylbenzene
RL: NUU (Other use, unclassified); USES (Uses)
(solvent; organoborane-metal borohydride reaction products with halogenation agents as hydrogenation-hydrogenolysis catalysts for high-mol.-weight **fuels**)

RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

(1) Adolf, L; GB 277974 A 1928 CAPLUS
(2) Exxon Research Engineering Co; GB 2270085 A 1994 CAPLUS

L49 ANSWER 14 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:869294 CAPLUS
DN 137:355255
ED Entered STN: 15 Nov 2002
TI Storage, **generation**, and use of **hydrogen**
IN McClaine, Andrew W.; Rolfe, Jonathan L.; Larsen, Christopher A.; Konduri, Ravi K.
PA USA
SO U.S. Pat. Appl. Publ., 14 pp., Cont.-in-part of U.S. Ser. No. 707,105.
CODEN: USXXCO
DT Patent
LA English
IC ICM C10J001-00
ICS B01J007-00
NCL 048197000R
CC 51-11 (Fossil Fuels, Derivatives, and Related Products)
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002166286	A1	20021114	US 2002-44813	20020111
PRAI	US 1999-309198	B3	19990510		
	US 2000-707105	A2	20001106		
	US 2001-261600P	P	20010112		
	US 2001-261601P	P	20010112		
	US 2001-261616P	P	20010112		

AB A composition comprising a carrier liquid; a dispersant; and a chemical hydride.
The composition can be used in a **hydrogen generator** to **generate hydrogen** for use, e.g., as a **fuel.** A regenerator recovers elemental metal from byproducts of the **hydrogen generation process.**
ST **hydrogen generation** hydride carrier dispersant
IT Alkanes, uses
Hydrocarbon **oils**
Hydrocarbons, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(carrier; storage, **generation**, and use of **hydrogen** for **fuel cells** using a carrier, a dispersant, and a hydride)
IT **Fuel cells**
(storage, **generation**, and use of **hydrogen** for **fuel cells** using a carrier, a dispersant, and a hydride)
IT Glycerides, uses
RL: MOA (Modifier or additive use); USES (Uses)
(triglycerides; dispersants; storage, **generation**, and use of **hydrogen** for **fuel cells** using a carrier, a dispersant, and a hydride)
IT Mixers (processing apparatus)

(ultrasonic; storage, **generation**, and use of **hydrogen** for **fuel cells** using a carrier, a dispersant, and a hydride)

IT 109-66-0, Pentane, uses 110-54-3, Hexane, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(carrier; storage, **generation**, and use of **hydrogen** for **fuel cells** using a carrier, a dispersant, and a hydride)

IT **122-32-7**, Oleic acid triglyceride
RL: MOA (Modifier or additive use); USES (Uses)
(dispersant; storage, **generation**, and use of **hydrogen** for **fuel cells** using a carrier, a dispersant, and a hydride)

IT **1333-74-0P**, **Hydrogen**, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(storage, **generation**, and use of **hydrogen** for **fuel cells** using a carrier, a dispersant, and a hydride)

IT **7580-67-8**, **Lithium hydride** 7646-69-7, Sodium hydride **7693-27-8**, **Magnesium hydride** 7789-78-8, Calcium hydride 13770-96-2, Sodium aluminum hydride **16853-85-3**, Lithium aluminum hydride 16940-66-2, Sodium borohydride **16949-15-8**, Lithium borohydride
RL: RCT (Reactant); RACT (Reactant or reagent)
(storage, **generation**, and use of **hydrogen** for **fuel cells** using a carrier, a dispersant, and a hydride)

L49 ANSWER 15 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:332665 CAPLUS
DN 136:357314
ED Entered STN: 03 May 2002
TI Low temperature sorbents for removal of sulfur compounds from fluid feed streams such as LPG and natural gas
IN Siriwardane, Ranjani
PA USA
SO U.S. Pat. Appl. Publ., 9 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM B01J020-04
ICS B01J020-20
NCL 502244000
CC 51-5 (Fossil Fuels, Derivatives, and Related Products)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002052291	A1	20020502	US 1999-409070	19990930
PRAI	US 1999-409070		19990930		

AB A sorbent material is provided comprising a material reactive with sulfur, a binder unreactive with sulfur and an inert material, wherein the sorbent absorbs the sulfur at temps. between 30 and 200°. Sulfur absorption

capacity as high as 22 weight percent was observed with these materials.
ST sorbent sulfur removal hydrocarbon gas
IT Cement
Molasses
(binder; low temperature sorbents for removal of sulfur compds. from fluid feed streams such as LPG and natural gas)
IT Bentonite, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(binder; low temperature sorbents for removal of sulfur compds. from fluid feed streams such as LPG and natural gas)
IT Petroleum products
(gases, liquefied; low temperature sorbents for removal of sulfur compds. from fluid feed streams such as LPG and natural gas)
IT **Fuel** gas manufacturing
Sorbents
(low temperature sorbents for removal of sulfur compds. from fluid feed streams such as LPG and natural gas)
IT Natural gas, processes
RL: CPS (Chemical process); EPR (Engineering process); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(low temperature sorbents for removal of sulfur compds. from fluid feed streams such as LPG and natural gas)
IT Aluminosilicates, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(porous support, porous support, binder; low temperature sorbents for removal
of sulfur compds. from fluid feed streams such as LPG and natural gas)
IT Zeolites (synthetic), uses
RL: TEM (Technical or engineered material use); USES (Uses)
(porous support; low temperature sorbents for removal of sulfur compds. from fluid feed streams such as LPG and natural gas)
IT Sand
RL: TEM (Technical or engineered material use); USES (Uses)
(support; low temperature sorbents for removal of sulfur compds. from fluid feed streams such as LPG and natural gas)
IT 1318-74-7, Kaolinite, uses 8062-15-5, Lignin sulfonate 9003-20-7, Polyvinyl acetate 9004-34-6, Cellulose, uses 9004-64-2, Hydropropyl cellulose 9004-65-3, Hydroxypropyl methyl cellulose 9005-25-8, Starch, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(binder; low temperature sorbents for removal of sulfur compds. from fluid feed streams such as LPG and natural gas)
IT 110-01-0, Tetrahydro thiophene 463-58-1, Carbonyl sulfide 7704-34-9, Sulfur, processes 7783-06-4, **Hydrogen** sulfide, **processes**
RL: REM (Removal or disposal); PROC (Process)
(low temperature sorbents for removal of sulfur compds. from fluid feed streams such as LPG and natural gas)
IT 7778-18-9, Calcium sulfate
RL: TEM (Technical or engineered material use); USES (Uses)
(porous support, binder; low temperature sorbents for removal of sulfur compds. from fluid feed streams such as LPG and natural gas)

IT 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses 1344-95-2, Calcium silicate 7440-44-0, Carbon, uses **7487-88-9**, Magnesium sulfate, uses 7631-86-9, Silica, uses 10103-46-5, Calcium phosphate 11126-29-7, Zinc silicate 13463-67-7, Titania, uses 37275-76-6, Zinc aluminate
RL: TEM (Technical or engineered material use); USES (Uses)
(porous support; low temperature sorbents for removal of sulfur compds. from fluid feed streams such as LPG and natural gas)

IT 298-14-6, Potassium bicarbonate 1309-33-7, Iron (III) hydroxide 1309-37-1, Ferric oxide, uses **1310-65-2**, Lithium hydroxide 1310-82-3, Rubidium hydroxide 1313-60-6, Sodium peroxide 1314-13-2, Zinc oxide, uses 1317-38-0, Copper (II) oxide, uses 55204-38-1, Zinc oxide hydrate
RL: TEM (Technical or engineered material use); USES (Uses)
(reactant; low temperature sorbents for removal of sulfur compds. from fluid feed streams such as LPG and natural gas)

IT 20427-59-2, Copper hydroxide
RL: TEM (Technical or engineered material use); USES (Uses)
(sorbent, reactant; low temperature sorbents for removal of sulfur compds. from fluid feed streams such as LPG and natural gas)

L49 ANSWER 16 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:241272 CAPLUS
DN 136:250325
ED Entered STN: 28 Mar 2002
TI Compositions for use in batteries, capacitors, **fuel** cells and similar devices and for **hydrogen production**
IN Schmidt, David G.
PA USA
SO U.S. Pat. Appl. Publ., 19 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01M004-46
ICS H01M010-26; H01M004-58; H01M004-62; C01B003-08; C22C021-00; H01M008-08; H01M008-06; H01G009-035; H01G009-045; H01M004-36; H01M010-26
NCL 429218100
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002037452	A1	20020328	US 2001-887531	20010622
	WO 2002052664	A2	20020704	WO 2001-US20159	20010622

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,

DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

PRAI US 2000-213395P P 20000623

AB This invention provides novel chemical compns., for use as electrode and electrolyte materials and for **hydrogen production**, methods for making these compns., and methods of using these compns. in a variety of applications. The new compns. of the present invention comprise: one or more transition metal compds.; aluminum; and either at least one soluble base or at least one soluble electrolyte in contact with the aluminum. The present invention may also comprise one or more elements and/or compds. having high mobility values for electrons, in some applications. This composition is useful as novel electrode/electrolyte components in devices such as batteries, capacitors, **fuel** cells and similar devices, and also useful in the direct **production** of **hydrogen** gas.

ST battery electrode electrolyte component; capacitor electrode electrolyte component; **fuel** cell electrode electrolyte component; **hydrogen prodn** compn

IT Melting
(arc; compns. for use in batteries, capacitors, **fuel** cells and similar devices and for **hydrogen production**)

IT Battery anodes
Battery electrolytes
Capacitor electrodes
Capacitors
Fuel cell electrodes
Fuel cell electrolytes
Primary batteries
(compns. for use in batteries, capacitors, **fuel** cells and similar devices and for **hydrogen production**)

IT Transition metal compounds
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(compns. for use in batteries, capacitors, **fuel** cells and similar devices and for **hydrogen production**)

IT 12054-48-7, Nickel hydroxide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(compns. for use in batteries, capacitors, **fuel** cells and similar devices and for **hydrogen production**)

IT 39396-58-2P
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(compns. for use in batteries, capacitors, **fuel** cells and similar devices and for **hydrogen production**)

IT 404011-87-6P 404011-88-7P
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(compns. for use in batteries, capacitors, **fuel** cells and similar devices and for **hydrogen production**)

IT 497-19-8, Sodium carbonate, uses 584-08-7, Potassium carbonate 1305-62-0, Calcium hydroxide, uses 1305-78-8, Calcia, uses **1309-42-8**, Magnesium hydroxide 1310-58-3, Potassium hydroxide,

uses **1310-65-2**, Lithium hydroxide 1310-73-2, Sodium hydroxide, uses 1310-82-3, Rubidium hydroxide 7429-90-5, Aluminum, uses 7439-88-5D, Iridium, compound 7439-89-6D, Iron, compound 7440-02-0D, Nickel, compound 7440-04-2D, Osmium, compound 7440-05-3D, Palladium, compound 7440-06-4D, Platinum, compound 7440-16-6D, Rhodium, compound 7440-18-8D, Ruthenium, compound 7440-48-4D, Cobalt, compound 7664-41-7, Ammonia, uses 17194-00-2, Barium hydroxide 18480-07-4, Strontium hydroxide 21351-79-1, Cesium hydroxide
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(compns. for use in batteries, capacitors, **fuel** cells and similar devices and for **hydrogen production**)

IT **1333-74-0P**, **Hydrogen**, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(compns. for use in batteries, capacitors, **fuel** cells and similar devices and for **hydrogen production**)

IT 409-21-2, Silicon carbide sic, uses 1303-00-0, Gallium arsenide, uses 1303-11-3, Indium arsenide, uses 1304-82-1, Bismuth telluride bi2te3 1306-25-8, Cadmium telluride, uses 1312-41-0, Indium antimonide 1314-91-6, Lead telluride 7440-21-3, Silicon, uses 7440-31-5, Tin, uses 7440-44-0, Carbon, uses 7440-56-4, Germanium, uses 7785-23-1, Silver bromide 11138-42-4, Mercury selenide 12006-14-3, Cadmium tin arsenide cdsnas2 12014-06-1, Cadmium indium telluride cdin2te4 12014-17-4, Cadmium silicon phosphide cdsip2 12037-74-0, Silicon zinc phosphide siznp2 12064-03-8, Gallium antimonide 12068-90-5, Mercury telluride 12069-00-0, Lead selenide 12362-59-3, Indium mercury telluride in2hg5te8 13494-80-9, Tellurium, uses 22398-80-7, Indium phosphide, uses 22831-42-1, Aluminum arsenide
RL: MOA (Modifier or additive use); USES (Uses)
(high electron mobility component; compns. for use in batteries, capacitors, **fuel** cells and similar devices and for **hydrogen production**)

L49 ANSWER 17 OF 34 METADEX COPYRIGHT 2004 CSA on STN
AN 2003(4):34-450 METADEX
TI Modern Concepts of Conversion and Storage of **Energy** by Dispersed Materials Absorption.
AU Minic, D. (University of Belgrade); Susic, M.V. (Serbian Academy of Sciences and Arts)
SO Science of Sintering (Sept.-Dec. 2002) 34, (3), 247-259, Graphs, Numerical Data, 34 ref.
ISSN: 0350-820X
DT Journal
CY Yugoslavia
LA English
AB Once **hydrogen** is **generated**, the question asked: How do we store **hydrogen**? **Hydrogen** can be stored in a variety of ways, each with specific advantages and disadvantages. The overall criteria for choosing a storage method should be safety and ease of use. Described in this paper and listed below are different storage methods available today (compressed **hydrogen**, **liquid carrier** storage, glass microsphere, chemically stored

hydrogen) in addition to some techniques that are still in the research and development stage: power balls, metal hydride tanks and carbon clusters. (Example materials: **Mg/Ni hydrides**, Fe/Ti **hydrides**, LaNi hydrides, carbon nanotubes

CC 34 Chemical and Electrochemical Properties

CT Journal Article; Iron compounds: Sorption; Alkaline earth metal compounds: Sorption; Rare earth compounds: Sorption; **Hydrogen**: Sorption; Hydrides; **Hydrogen** storage; **Fuel** cells; **Hydrogenation**

ET Mg; Fe; La*Ni; La sy 2; sy 2; Ni sy 2; LaNi; La cp; cp; Ni cp

L49 ANSWER 18 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN

AN 2001:833211 CAPLUS

DN 135:373651

ED Entered STN: 16 Nov 2001

TI Method of **hydrogen generation** for **fuel** cell applications and a **hydrogen-generating** system

IN Zaluski, Leszek; Zaluska, Alicja; Strom-Olsen, John Olaf

PA McGill University, Can.

SO PCT Int. Appl., 23 pp.
CODEN: PIXXD2

DT Patent

LA English

IC ICM C01B003-06
ICS B01J007-02; B01J008-02

CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 52

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001085606	A1	20011115	WO 2001-CA682	20010514
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	BR 2001010737	A	20030211	BR 2001-10737	20010514
	EP 1284922	A1	20030226	EP 2001-933494	20010514
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	US 2003157018	A1	20030821	US 2002-257943	20021023
PRAI	CA 2000-2308514	A	20000512		
	WO 2001-CA682	W	20010514		

AB **Hydrogen** is **generated** by reaction of a metal hydride and ≥1 alc. which may be employed in conjunction with water. This arrangement provides a convenient, efficient method of **generating hydrogen** for a **fuel** cell.

ST **hydrogen generation fuel** cell; metal hydride

alc reaction **hydrogen generation**
IT **Fuel** cells
(**hydrogen generation** for)
IT Alcohols, reactions
Hydrides
RL: RCT (Reactant); RACT (Reactant or reagent)
(in **hydrogen generation** for **fuel** cells)
IT **1333-74-0P**, **Hydrogen**, preparation
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
(**hydrogen generation** for **fuel** cells by reaction of alc. and metal hydride)
IT 64-17-5, Ethanol, reactions 67-56-1, Methanol, reactions **7580-67-8**, **Lithium hydride** 7646-69-7, Sodium hydride 7693-26-7, Potassium hydride **7693-27-8**, **Magnesium hydride** (MgH2) 7704-98-5, Titanium hydride (TiH2) 7704-99-6, Zirconium hydride (ZrH2) 7789-78-8, Calcium hydride (CaH2) 13770-96-2, Sodium aluminum hydride (NaAlH4) **16853-85-3**, Lithium aluminum hydride (LiAlH4) 16940-66-2, Sodium borohydride (NaBH4) **16941-14-3** **16949-15-8**, Lithium borohydride (LiBH4) 17069-12-4, Sodium aluminum hydride (Na3AlH6) **17083-88-4**, Lithium aluminum hydride (LiAl2H7) **17300-62-8** **19321-21-2**, Lithium beryllium hydride (Li2BeH4) 39433-92-6, Iron titanium hydride (FeTiH2) 262610-57-1, Zirconium aluminum hydride (ZrAl2H8) **374081-48-8**, Beryllium **lithium hydride** (Be2Li3H7)
RL: RCT (Reactant); RACT (Reactant or reagent)
(in **hydrogen generation** for **fuel** cells)
RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Ceskoslovenska Akademie Ved; GB 1189512 A 1970 CAPLUS
(2) Long, E; US 5593640 A 1997 CAPLUS
(3) McNeilab Inc; EP 0115406 A 1984 CAPLUS
(4) Taschek, W; US 4155712 A 1979 CAPLUS

L49 ANSWER 19 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2002-133921 [18] WPIX
DNN N2002-101317 DNC C2002-041289
TI **Generation** of **hydrogen** for use in **fuel** cell involves heating **hydrogen-producing** material containing a mixture of at least two types of hydrides.
DC E36 H06 L03 X16
PA (TOYW) TOYOTA CHUO KENKYUSHO KK
CYC 1
PI JP 2001253702 A 20010918 (200218)* 7 C01B003-04
ADT JP 2001253702 A JP 2000-63724 20000308
PRAI JP 2000-63724 20000308
IC ICM C01B003-04
ICA H01M008-04
AB JP2001253702 A UPAB: 20020319
NOVELTY - **Hydrogen** is **produced** by heating **hydrogen-producing** material containing a mixture of at

least two types of hydrides.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for **hydrogen-producing** material containing mixture of at least two types of hydrides.
USE - In synthetic chemical industry, petroleum refining and **fuel** cells.
ADVANTAGE - Thermolysis is accelerated by the synergistic effect of hydride combination and large quantity of **hydrogen** is **produced** efficiently, at low temperature in short time without use of a catalyst.
Dwg.0/1
FS CPI EPI
FA AB; DCN
MC CPI: E31-A02; E31-A04; H06-A03; L03-E04F
EPI: X16-C09

L49 ANSWER 20 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1999:811536 CAPLUS
DN 132:37713
ED Entered STN: 24 Dec 1999
TI Propellant
IN Voronov, Alexei; Weise, Thomas; Haak, Hans Karl; Wisken, Holger
PA TZN Forschungs- und Entwicklungszentrum Unterluess G.m.b.H., Germany
SO Ger. Offen., 4 pp.
CODEN: GWXXBX
DT Patent
LA German
IC ICM F41A001-00
ICS F42B005-16; F42B005-02; C06B043-00
CC 50-1 (Propellants and Explosives)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 19827380	A1	19991223	DE 1998-19827380	19980619
PRAI	DE 1998-19827380		19980619		

AB A propellant for firing off bullets from weapons contains water and a metal hydride which reacts exothermically with water to **H2**(g). The latter forms the propellant gas. Preferably, the hydride (e.g., TiH2) reacts with water at >100°. Water can be present in microcapsules or the propellant consists of layered plastic containers which contain alternately the metal hydride powder and water to provide satisfactory phlegmatization.
ST propellant **hydrogen**
IT Propellants (**fuels**)
(**hydrogen** propellant for firing off bullets)
IT **Hydrides**
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(in **production** of **hydrogen** propellant)
IT **7580-67-8**, **Lithium hydride 7693-27-8**
, **Magnesium hydride** (MgH2) 7704-98-5, Titanium hydride (TiH2) 7784-21-6, Aluminum hydride 13598-30-6, Scandium hydride (ScH2) 13598-35-1, Yttrium hydride (YH2) **16853-85-3**,

Lithium aluminum hydride(LiAlH4)
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(in **production** of **hydrogen** propellant)
IT 7732-18-5, Water, **processes**
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(in **production** of **hydrogen** propellant from **hydrides**)
IT **1333-74-0, Hydrogen**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(propellant for firing off bullets)

L49 ANSWER 21 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1999-443970 [37] WPIX
DNN N1999-331129 DNC C1999-130744
TI Apparatus for converting **energy.**
DC E36 L03 X16
IN BOSSEL, U; BOSSEL, U G
PA (BOSS-I) BOSSEL U G; (BOSS-I) BOSSEL U; (DCHT-N) DCH TECHNOLOGY INC
CYC 82
PI WO 9933133 A1 19990701 (199937)* GE 32 H01M008-06
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG ZW
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZW
AU 9914784 A 19990712 (199950)
DE 19881977 T 20000316 (200021) H01M008-06
US 6316133 B1 20011113 (200173) H01M008-04
CH 692879 A5 20021129 (200282) H01M008-06
ADT WO 9933133 A1 WO 1998-CH539 19981216; AU 9914784 A AU 1999-14784 19981216; DE 19881977 T DE 1998-1081977 19981216, WO 1998-CH539 19981216; US 6316133 B1 WO 1998-CH539 19981216, US 1999-367674 19991229; CH 692879 A5 CH 1997-2921 19971218
FDT AU 9914784 A Based on WO 9933133; DE 19881977 T Based on WO 9933133; US 6316133 B1 Based on WO 9933133
PRAI CH 1997-2921 19971218
IC ICM H01M008-04; H01M008-06
ICS H01M008-24
AB WO 9933133 A UPAB: 19990914
NOVELTY - The apparatus uses **fuel** cells with proton-conducting electrolytes and integrated **hydrogen** gas **production** the **fuel** cells each have an opening which form the **hydrogen** distribution channel over which the **hydrogen** gas distribution is provided into individual **fuel** cells. A tension rod for holding the **fuel** cells together in the **fuel** cell stack is also arranged in the openings.
DETAILED DESCRIPTION - The apparatus for converting **energy** using **fuel** cells (1) with proton-conducting electrolytes and with integrated **hydrogen** gas **production** comprises a reaction chamber (2), in which **hydrogen** gas is **produced** through the reaction of water (8) with one or more hydrides (6). The gas

is then transferred into a **hydrogen** distribution channel (14) of a **fuel** cell stack (15). The **fuel** cells (1) each have an opening (18) which forms the **hydrogen** distribution channel (14) and over which the **hydrogen** gas distribution is provided into individual **fuel** cells. A tension rod (19) for holding the **fuel** cells together in the **fuel** cell stack (15) is also arranged in the openings (18).

An INDEPENDENT CLAIM is also included for a the process for **producing hydrogen** gas in the apparatus converting **energy** using **fuel** cells (1) with proton-conducting electrolytes.

USE - For converting **energy** using **fuel** cells (1) with proton-conducting electrolytes and with integrated **hydrogen** gas **production.**

ADVANTAGE - Simplified apparatus for the **production** of **hydrogen.**

DESCRIPTION OF DRAWING(S) - The drawing shows a cross-section of the apparatus for converting **energy.**

fuel cells 1
reaction chamber 2
ventilator 3
fuel cell stack 15
tension rod 19
Dwg.2/6

FS CPI EPI
FA AB; GI; DCN
MC CPI: E31-A02; L03-E04
EPI: X16-C

L49 ANSWER 22 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1998:763197 CAPLUS
DN 130:54791
ED Entered STN: 07 Dec 1998
TI **Production** of **hydrogen** gas from novel chemical **hydrides**
AU Aiello, R.; Matthews, M. A.; Reger, D. L.; Collins, J. E.
CS Dept. of Chemical Engineering, Swearingen Engineering Center, University of South Carolina, Columbia, SC, 29208, USA
SO International Journal of Hydrogen Energy (1998), 23(12), 1103-1108
CODEN: IJHEDX; ISSN: 0360-3199
PB Elsevier Science Ltd.
DT Journal
LA English
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
AB Six ligand-stabilized complexes have been synthesized and tested for use as **hydrogen** storage media for portable **fuel** cell applications. The new **hydrides** are: [HC(3,5-Me2pz)3]LiBH4 (1), {[H2C(3,5-Me2pz)2]Li(BH4)}2 (2) (pz = pyrazolyl), [(TMEDA)Li(BH4)]2 (3) (TMEDA = (CH3)2NCH2CH2N(CH3)2), [HC(pz)3]LiBH4 (4), {[H2C(pz)2]Li(BH4)}2 (5) and Mg(BH4)23THF (6) (THF = tetrahydrofuran). Hydrolysis reactions of the compds. liberate **hydrogen** in quantities which range from 56 to 104 (±5%) percent of the theor. yield. Gas chromatog. anal. of the

product gases from these reactions indicate that **hydrogen** is the only gas produced. Thermally initiated reactions of the novel compds. with NH4Cl were unsuccessful. Although the amount of **hydrogen energy** which can be theor. obtained per unit weight is lower than that of the classical **hydrides** such as LiBH4 and NaBH4, the reactions are less violent and hydrolysis of compds. 1, 2, 4, 5 and 6 releases less heat per mol of **hydrogen generated.**

ST **fuel** cell **hydrogen** storage chem hydride; borohydride ligand stabilized complex **hydrogen** storage

IT Hydrolysis enthalpy
(**production** of **hydrogen** gas from novel chemical **hydrides** for **fuel** cell use)

IT **1333-74-0, Hydrogen**, uses
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**production** of **hydrogen** gas from novel chemical **hydrides** for **fuel** cell use)

IT **12122-78-0 108678-81-5 199595-14-7 199595-16-9 199595-17-0 199595-18-1**
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(**production** of **hydrogen** gas from novel chemical **hydrides** for **fuel** cell use)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Armstrong, D; Chem Soc Chem Commun 1987, P630 CAPLUS
(2) Beckert, W; US 3734863 1973 CAPLUS
(3) Browning, D; An Investigation of Hydrogen Storage Methods for Fuel Cell Operation with Man-Portable Equipment 1996
(4) Davis, W; J Am Chem Soc 1949, V71, P2775 CAPLUS
(5) Libowitz, G; The Solid State Chemistry of Binary Metal Hydrides 1965
(6) Noth, H; Z Naturforsch 1982, V37, P1499
(7) Reger, D; to be published in Inorg Chem
(8) Schlesinger, H; J Am Chem Soc 1953, V75, P215 CAPLUS
(9) Stearns, J; to be published in Int J Hydrogen Energy

L49 ANSWER 23 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1996:599019 CAPLUS
DN 125:225967
ED Entered STN: 09 Oct 1996
TI Gas-generating mixture for airbags
IN Redecker, Klaus; Weuter, Waldemar; Bley, Ulrich
PA Dynamit Nobel Ag, Germany
SO Ger. Offen., 10 pp.
CODEN: GWXXBX
DT Patent
LA German
IC ICM C06D005-06
ICA B60R021-26; C07D257-06; C07D257-04; C07D251-12; C07D249-14; C07D249-12; C07D251-54
CC 50-1 (Propellants and Explosives)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 19505568	A1	19960822	DE 1995-19505568	19950218
	CA 2211579	AA	19960829	CA 1996-2211579	19960213
	WO 9626169	A1	19960829	WO 1996-EP605	19960213
	W: BR, CA, CN, CZ, JP, KR, MX, PL, RU, TR, US, VN				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	EP 809616	A1	19971203	EP 1996-902269	19960213
	R: AT, DE, ES, FR, GB, IT, SE				
	CN 1183758	A	19980603	CN 1996-193147	19960213
	BR 9607444	A	19980630	BR 1996-7444	19960213
	JP 11500098	T2	19990106	JP 1996-525361	19960213
	PL 183318	B1	20020628	PL 1996-321832	19960213
PRAI	DE 1995-19505568	A	19950218		
	WO 1996-EP605	W	19960213		

OS MARPAT 125:225967

AB A propellant for gas generators consists of (1) a N-containing compound from a group of tetrazole, triazole, triazine, HCN, urea, their derivs. or salts as a **fuel**, (2) ≥3 compds. from a group of peroxides, nitrates, chlorates, or perchlorates as an oxidation agent, (3) combustion moderators which affect combustion and combustion rate by heterogeneous or homogeneous catalysis, and optionally (4) additives decreasing the amount of toxic gases. The mixts. do not generate toxic products during combustion in airbags.

ST gas generator airbag inflation

IT Gas generators
RL: TEM (Technical or engineered material use); USES (Uses)
(for **automobile** airbags)

IT Safety devices
RL: TEM (Technical or engineered material use); USES (Uses)
(airbags, gas generators for)

IT 51-79-6, Urethane 62-56-6, Thiourea, uses 67-52-7, Barbituric acid 79-17-4, Aminoguanidine 102-54-5, Ferrocene 108-19-0, Biuret 108-78-1, Melamine, uses 108-80-5, Cyanuric acid 113-00-8, Guanidine 290-87-9, 1,3,5-Triazine 461-58-5, 1-Cyanoguanidine 506-93-4, Guanidine nitrate 556-88-7, Nitroguanidine 557-05-1, Zinc stearate 591-01-5, Dicyanodiamidine sulfate 917-61-3, Sodium cyanate 932-64-9, 3-Nitro-1,2,4-triazol-5-one 1314-13-2, Zinc oxide, uses 1314-22-3, Zinc peroxide 1317-33-5, Molybdenum sulfide, uses 1934-75-4, Sodium dicyanamide 2165-23-3 2582-30-1, Aminoguanidine **hydrogen** carbonate 2783-98-4, 5,5'-Bitetrazole 4000-16-2, Triaminoguanidine nitrate 4045-72-1, 3H-1,2,4-Triazol-3-one 4076-36-2, 5-Methyltetrazole 4418-61-5, 5-Aminotetrazole 5378-52-9 5422-45-7 5467-78-7, 1-Phenyl-5-aminotetrazole 6154-04-7, 2-Methyl-5-aminotetrazole 6280-33-7 6484-52-2, Ammonium nitrate, uses 7439-89-6, Iron, uses 7439-98-7, Molybdenum, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-21-3, Silicon, uses 7440-32-6, Titanium, uses 7440-42-8, Boron, uses 7440-50-8, Copper, uses 7440-66-6, Zinc, uses 7631-99-4, Sodium nitrate, uses 7704-34-9, Sulfur, uses 7757-79-1, Potassium nitrate, uses 7778-74-7, Potassium perchlorate 7782-42-5, Graphite, uses **7790-69-4**, Lithium

nitrate 7790-98-9, Ammonium perchlorate 9002-84-0, Teflon
10042-76-9, Strontium nitrate 10043-11-5, Boron nitride (BN), uses
10308-82-4, Aminoguanidine nitrate 13175-00-3 **14807-96-6**,
Talc, uses 14832-59-8 15454-56-5 16421-52-6, 5-Hydroxytetrazole
16681-77-9, 1-Methyltetrazole 16681-78-0, 2-Methyltetrazole 16687-60-8
17267-51-5, 1-Methyl-5-methylaminotetrazole 18039-42-4,
5-Phenyltetrazole 24994-04-5, 5-(p-Tolyl)-tetrazole 31330-63-9,
Tetrazene 31602-64-9, 1H-Tetrazole-5-ethanamine 43146-62-9,
5-Aminotetrazole nitrate 46047-18-1 50917-68-5, Semicarbazide nitrate
53010-03-0 55513-24-1 56476-95-0, 2-Phenyltetrazole 88511-19-7
95112-14-4, 2-Ethyl-5-aminotetrazole 136369-04-5 142353-07-9
145315-16-8 **170695-08-6** 181648-89-5 **181648-90-8**
181648-91-9 181648-94-2 181648-97-5 181648-98-6 181648-99-7
181649-00-3 181649-01-4
RL: NUU (Other use, unclassified); USES (Uses)
(in gas **generator** for **automobile** airbags)

L49 ANSWER 24 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1991:611801 CAPLUS
DN 115:211801
ED Entered STN: 15 Nov 1991
TI Dense **hydrogen** and oxygen sources for **fuel** cells
AU Dunn, Paul M.; Egan, Christopher J.; Harbison, William L.; Pitcher, Gerald K.
CS Nav. Underwater Syst. Cent., Newport, RI, 02841-5047, USA
SO Proceedings of the Intersociety Energy Conversion Engineering Conference (1991), 26th(3), 527-32
CODEN: PIECDE; ISSN: 0146-955X
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
AB A preliminary evaluation of dense H and O sources, i.e., compds. that release the elements in large vols., for use with **fuel** cells was carried out. Sources for O are: chlorates, perchlorates, peroxides, and superoxides by thermal decomposition and reaction with water and candle tests were carried out to demonstrate controlled generation. Sources for H include **hydrides** by reaction with water or by thermal decomposition; CaH2 and LiAlH4 were effective sources in closed systems.
ST oxygen dense source **fuel** cell; **hydrogen** dense source **fuel** cell; candle test chlorate oxygen source; hydride reaction water **hydrogen** source
IT **Fuel** cells
(dense **hydrogen** and oxygen sources for, evaluation of)
IT **1333-74-0P**, **Hydrogen**, preparation
RL: PREP (Preparation)
(preparation of, by reaction of water with **hydrides**, for **fuel** cell use)
IT 7782-44-7P, Oxygen, preparation
RL: PREP (Preparation)
(preparation of, by thermal decomposition of sodium chlorate in candle test, for

fuel cell use)
IT 7732-18-5, Water, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with **hydrides**, for **hydrogen generation** for **fuel** cells)
IT **7580-67-8**, **Lithium hydride** (LiH)
7693-27-8, **Magnesium hydride** (MgH2)
7789-78-8, Calcium hydride (CaH2) **16853-85-3**, Aluminum **lithium hydride** (LiAlH4) 16940-66-2 **16949-15-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with water, for **hydrogen generation** for **fuel** cells)
IT 7775-09-9, Sodium chlorate (NaClO3)
RL: RCT (Reactant); RACT (Reactant or reagent)
(thermal decomposition of, candle test for oxygen generation in, for **fuel** cell)

L49 ANSWER 25 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1992:135528 CAPLUS
DN 116:135528
ED Entered STN: 03 Apr 1992
TI Performance-oriented packaging standards; changes to classification, hazard communication, packaging and handling requirements based on UN standards and agency initiative
CS United States Dept. of Transportation, Washington, DC, 20590-0001, USA
SO Federal Register (1990), 55(246), 52402-729, 21 Dec 1990
CODEN: FEREAC; ISSN: 0097-6326
DT Journal
LA English
CC 59-6 (Air Pollution and Industrial Hygiene)
AB The hazardous materials regulations under the Federal Hazardous Materials Transportation Act are revised based on the United Nations recommendations on the transport of dangerous goods. The regulations cover the classification of materials, packaging requirements, and package marking, labeling, and shipping documentation, as well as transportation modes and handling, and incident reporting. Performance-oriented stds. are adopted for packaging for bulk and nonbulk transportation, and SI units of measurement generally replace US customary units. Hazardous material descriptions and proper shipping names are tabulated together with hazard class, identification nos., packing group, label required, special provisions, packaging authorizations, quantity limitations, and vessel stowage requirements.
ST hazardous chem transport packaging
IT Infection
(agents, packaging and transport of, stds. for)
IT Resin acids and Rosin acids
RL: USES (Uses)
(aluminum salts, packaging and transport of, stds. for)
IT Alkaline earth metals
RL: USES (Uses)
(amalgams, packaging and transport of, stds. for)
IT Alkali metals, miscellaneous

RL: MSC (Miscellaneous)
(amalgams, packaging and transport of, stds. for)
IT Dyes
(coal tar, packaging and transport of, stds. for)
IT Packaging materials
(for hazardous material transport, stds. for)
IT Standards, legal and permissive
(for hazardous material transportation)
IT Bromates
Chlorites
RL: USES (Uses)
(inorg., packaging and transport of, stds. for)
IT Appliances
(life-saving, packaging and transport of, stds. for)
IT Borates
RL: USES (Uses)
(mixts. containing chlorates, packaging and transport of, stds. for)
IT Chlorates
RL: USES (Uses)
(mixts. containing, packaging and transport of, stds. for)
IT Diazonium compounds
RL: USES (Uses)
(nitrates, packaging and transport of, stds. for)
IT Paper
(oiled, packaging and transport of, stds. for)
IT Adhesives
Alcoholic beverages
Ammunition
Antifreeze substances
Bactericides, Disinfectants, and Antiseptics
Batteries, primary
Blasting gelatin
Bombs (explosives)
Carbon paper
Cartridges
Castor bean
Coating materials
Corrosive substances
Cotton
Creosote
Detonators
Dyes
Dynamite
Electric fuses
Exothermic materials
Explosives
Flavoring materials
Flue dust
Fuel cells
Fuel oil
Fuels, diesel
Fuels, jet aircraft

Fusel **oil**
Fuses, explosives
Gas **oils**
Hay
Herbicides
Igniters and Lighters
Insecticides
Lacrimators
Magnetic substances
Matches
Oxidizing agents
Perfumes
Pesticides
Petroleum products
Pharmaceuticals
Photoelectric devices
Poisons
Primers, explosive
Projectiles
Pyrophoric substances
Pyrotechnic compositions
Radioactive substances
Refrigerating apparatus
Rockets
Shale **oils**
Solvent naphtha
Sprays
Straw
Textiles
Thermoelectric devices
Torpedoes (weapons)
Turpentine
Wood preservatives
(packaging and transport of, stds. for)

IT Alcohols, miscellaneous
Aldehydes, miscellaneous
Alkali metal alloys, base
Alkali metals, miscellaneous
Alkaline earth alloys, base
Alkaline earth metals
Alkaloids, miscellaneous
Amines, miscellaneous
Arsenates
Arsenites
Asbestos
Asphalt
Bases, miscellaneous
Charcoal
Coal
Coke
Cyanates
Cyanides, miscellaneous

Fibers
Fluorides, miscellaneous
Gasoline
Helium-group gases, miscellaneous
Hydrides
Hypochlorites
Kerosine
Ketones, uses
Ligroine
Metals, miscellaneous
Naphtha
Natural gas
Natural gas condensates
Nitrates, miscellaneous
Nitrites
Perchlorates
Permanganates
Peroxides, uses
Petroleum
Petroleum gases, liquefied
Polyamines
Polyesters, miscellaneous
Rosin **oil**
Selenates
Selenites
Sulfonic acids, miscellaneous
Tar
Terpenes and Terpenoids, miscellaneous
Thiols, uses
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(packaging and transport of, stds. for)

IT Refrigeration
(agents, packaging and transport of, stds. for)

IT Sulfonic acids, miscellaneous
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(alkane, packaging and transport of, stds. for)

IT Phenols, miscellaneous
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(alkyl, packaging and transport of, stds. for)

IT Alkali metals, compounds
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(amides, packaging and transport of, stds. for)

IT Fertilizers
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(ammonium nitrate, packaging and transport of, stds. for)

IT Gasoline additives
(antiknock, packaging and transport of, stds. for)

IT Sulfonic acids, miscellaneous
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(arene, packaging and transport of, stds. for)
IT Nitro compounds
RL: USES (Uses)
(aryl, potassium salts, packaging and transport of, stds. for)
IT Nitro compounds
RL: USES (Uses)
(aryl, sodium salts, packaging and transport of, stds. for)
IT **Fuels**
(aviation, packaging and transport of, stds. for)
IT Propellants
(black powder, packaging and transport of, stds. for)
IT Hydraulic fluids
(brake, packaging and transport of, stds. for)
IT Flours and Meals
(cakes, packaging and transport of, stds. for)
IT Resin acids and Rosin acids
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(calcium salts, packaging and transport of, stds. for)
IT Essential **oils**
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(camphor, packaging and transport of, stds. for)
IT Silanes
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(chloro, packaging and transport of, stds. for)
IT Solvents
(cleaning, packaging and transport of, stds. for)
IT Tar
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(coal, packaging and transport of, stds. for)
IT **Fuel** gases
(coal gas, packaging and transport of, stds. for)
IT Naphthenic acids, compounds
Resin acids and Rosin acids
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(cobalt salts, packaging and transport of, stds. for)
IT Coconut
(copra, packaging and transport of, stds. for)
IT Asbestos
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(crocidolite, packaging and transport of, stds. for)
IT Petroleum products
(distillates, packaging and transport of, stds. for)
IT Rockets

(engines, packaging and transport of, stds. for)
IT Fire
(extinguishers, packaging and transport of, stds. for)
IT Pyrotechnic compositions
(fireworks, packaging and transport of, stds. for)
IT Pyrotechnic compositions
(flare, packaging and transport of, stds. for)
IT Silicates, miscellaneous
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(fluoro-, packaging and transport of, stds. for)
IT Gasoline
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(gasohol, packaging and transport of, stds. for)
IT Ammunition
(grenades, packaging and transport of, stds. for)
IT Asbestos
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(grunerite, packaging and transport of, stds. for)
IT Sulfites
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(**hydrogen**, packaging and transport of, stds. for)
IT Organic compounds, miscellaneous
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(iodyl, packaging and transport of, stds. for)
IT Group VIII elements
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(iron-group, packaging and transport of, stds. for)
IT Air
Corrosive substances
(liquid, packaging and transport of, stds. for)
IT Gases
(liquefied, packaging and transport of, stds. for)
IT Resin acids and Rosin acids
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(manganese salts, packaging and transport of, stds. for)
IT Castor bean
Fish
(meal, packaging and transport of, stds. for)
IT Organometallic compounds
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(metal alkyls, packaging and transport of, stds. for)
IT Explosives
(mines, packaging and transport of, stds. for)
IT Carbohydrates and Sugars, miscellaneous

RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(nitro, packaging and transport of, stds. for)

IT Aromatic compounds
RL: USES (Uses)
(nitro, potassium salts, packaging and transport of, stds. for)

IT Aromatic compounds
RL: USES (Uses)
(nitro, sodium salts, packaging and transport of, stds. for)

IT Fertilizers
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(nitrogen, packaging and transport of, stds. for)

IT Peroxides, miscellaneous
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(organic, packaging and transport of, stds. for)

IT Coating materials
(paints, packaging and transport of, stds. for)

IT Essential **oils**
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(pine, packaging and transport of, stds. for)

IT Inks
(printing, packaging and transport of, stds. for)

IT Matches
(safety, packaging and transport of, stds. for)

IT Alkaloids, compounds
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(salts, packaging and transport of, stds. for)

IT Containers
(shipping, for hazardous material transport, stds. for)

IT Pyrotechnic compositions
(signal rockets, packaging and transport of, stds. for)

IT Pyrotechnic compositions
(smoke-generating, packaging and transport of, stds. for)

IT Propellants
(smokeless, packaging and transport of, stds. for)

IT Pharmaceutical dosage forms
(tinctures, packaging and transport of, stds. for)

IT Ammunition
Pyrotechnic compositions
(tracers, packaging and transport of, stds. for)

IT Resin acids and Rosin acids
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(zinc salts, packaging and transport of, stds. for)

IT 64-17-5
RL: OCCU (Occurrence)
(alcoholic beverages, packaging and transport of, stds. for)

IT 50-00-0, Formaldehyde, miscellaneous 54-11-5, Nicotine 54-11-5D,

Nicotine, compds. 55-63-0, Nitroglycerin 55-68-5, Phenylmercuric nitrate 56-18-8, 3,3'-Iminodipropylamine 56-23-5, miscellaneous 56-38-2, Parathion 57-06-7, Allyl isothiocyanate 57-14-7 57-24-9D, Strychnine, salts 60-00-4, EDTA, miscellaneous 60-24-2 60-29-7, Diethyl ether, miscellaneous 60-34-4, Methylhydrazine 60-57-1, Dieldrin 62-38-4, Phenylmercuric acetate 62-53-3, Aniline, miscellaneous 62-74-8, Sodium fluoroacetate 64-17-5, Ethanol, miscellaneous 64-18-6, Formic acid, miscellaneous 64-18-6D, Formic acid, chloro derivs. 64-19-7, Acetic acid, miscellaneous 64-67-5, Diethyl sulfate 66-25-1, Hexaldehyde 67-56-1, Methanol, miscellaneous 67-63-0, Isopropanol, miscellaneous 67-64-1, Acetone, miscellaneous 67-66-3, Chloroform, miscellaneous 68-11-1, Thioglycolic acid, miscellaneous 68-12-2, N,N-Dimethylformamide, miscellaneous 70-11-1, Phenacyl bromide 70-30-4, Hexachlorophene 71-23-8, n-Propanol, miscellaneous 71-41-0, 1-Pentanol, miscellaneous 71-43-2, Benzene, miscellaneous 71-55-6, 1,1,1-Trichloroethane 74-82-8, Methane, miscellaneous 74-83-9, miscellaneous 74-84-0, Ethane, miscellaneous 74-85-1, Ethylene, miscellaneous 74-86-2, Acetylene, miscellaneous 74-87-3, Methyl chloride, miscellaneous 74-88-4, Methyl iodide, miscellaneous 74-89-5, Methylamine, miscellaneous 74-90-8, **Hydrogen** cyanide, miscellaneous 74-93-1, Methyl mercaptan, miscellaneous 74-95-3, Dibromomethane 74-96-4, Ethyl bromide 74-97-5, Bromochloromethane 74-98-6, Propane, miscellaneous 75-00-3, Ethyl chloride 75-01-4, miscellaneous 75-02-5, Vinyl fluoride 75-04-7, Ethylamine, miscellaneous 75-05-8, Methyl cyanide, miscellaneous 75-07-0, Acetaldehyde, miscellaneous 75-08-1, Ethyl mercaptan 75-09-2, Dichloromethane, miscellaneous 75-15-0, Carbon disulfide, miscellaneous **75-16-1**, Methyl magnesium bromide 75-18-3, Dimethyl sulfide 75-19-4, Cyclopropane 75-20-7, Calcium carbide 75-21-8 75-21-8, Ethylene oxide, miscellaneous 75-25-2, Bromoform 75-26-3, 2-Bromopropane 75-28-5, Isobutane 75-28-5D, Isobutane, mixts. 75-29-6, 2-Chloropropane 75-31-0, Isopropylamine, miscellaneous 75-33-2, Isopropyl mercaptan 75-34-3, 1,1-Dichloroethane 75-35-4, miscellaneous 75-36-5, Acetyl chloride 75-38-7, 1,1-Difluoroethylene 75-39-8, Acetaldehyde ammonia 75-43-4, Dichloromonofluoromethane 75-44-5, Phosgene 75-45-6, Chlorodifluoromethane 75-46-7, Trifluoromethane 75-50-3, Trimethylamine, miscellaneous 75-52-5, Nitromethane, miscellaneous 75-54-7, Methyldichlorosilane 75-55-8, Propylenimine 75-56-9, Propylene oxide, miscellaneous 75-59-2, Tetramethylammonium hydroxide 75-60-5, Cacodylic acid 75-61-6, Dibromodifluoromethane 75-63-8 75-71-8, Dichlorodifluoromethane 75-72-9, Chlorotrifluoromethane 75-73-0, Tetrafluoromethane 75-76-3, Tetramethylsilane 75-77-4, Trimethylchlorosilane, miscellaneous 75-78-5, Dimethyldichlorosilane 75-79-6, Methyltrichlorosilane 75-83-2 75-86-5, Acetone cyanohydrin 75-87-6, Chloral 75-91-2, tert-Butyl hydroperoxide 75-94-5, Vinyltrichlorosilane 76-01-7, Pentachloroethane 76-02-8, Trichloroacetyl chloride 76-03-9, properties 76-05-1, Trifluoroacetic acid, miscellaneous 76-06-2, Chloropicrin 76-06-2D, Chloropicrin, mixts. 76-15-3 76-16-4, Hexafluoroethane 76-19-7, Octafluoropropane 76-22-2, Camphor 77-47-4, Hexachlorocyclopentadiene 77-73-6 77-78-1, Dimethyl sulfate 78-00-2, Tetraethyl lead 78-10-4, Tetraethyl silicate

78-62-6, Dimethyldiethoxysilane 78-67-1, Azodiisobutyronitrile 78-76-2, 2-Bromobutane 78-78-4, Isopentane 78-79-5, Isoprene, miscellaneous 78-81-9, Isobutylamine 78-82-0, Isobutyronitrile 78-83-1, Isobutanol, miscellaneous 78-84-2, Isobutyraldehyde 78-85-3, Methacrylaldehyde 78-87-5, Propylene dichloride 78-89-7, Propylene chlorohydrin 78-90-0, 1,2-Propylenediamine 78-93-3, 2-Butanone, miscellaneous 78-94-4, Methyl vinyl ketone, miscellaneous 78-95-5, Monochloroacetone 79-01-6, Trichloroethylene, miscellaneous 79-03-8, Propionyl chloride 79-04-9, Chloroacetyl chloride 79-06-1, Acrylamide, miscellaneous 79-08-3, Bromoacetic acid 79-09-4, Propionic acid, miscellaneous 79-10-7, 2-Propenoic acid, miscellaneous 79-11-8, Chloroacetic acid, miscellaneous 79-20-9, Methyl acetate 79-21-0, Peroxyacetic acid 79-22-1 79-24-3, Nitroethane 79-29-8, 2,3-Dimethylbutane 79-30-1, Isobutyryl chloride 79-31-2, Isobutyric acid 79-36-7, Dichloroacetyl chloride 79-38-9 79-41-4, miscellaneous 79-42-5 79-43-6, Dichloroacetic acid, miscellaneous 79-44-7, Dimethylcarbamoyl chloride 80-10-4, Diphenyldichlorosilane 80-15-9, Cumene hydroperoxide 80-17-1, Benzene sulfohydrazide 80-47-7, p-Menthane hydroperoxide 80-51-3, Diphenyloxide-4,4'-disulfohydrazide 80-56-8, α-Pinene 80-62-6 81-15-2 82-71-3 85-44-9, 1,3-Isobenzofurandione 86-50-0, Azinphos methyl 87-68-3, Hexachlorobutadiene 87-90-1 88-17-5, 2-Trifluoromethylaniline 88-72-2, o-Nitrotoluene 88-73-3, o-Chloronitrobenzene 88-74-4, o-Nitroaniline 88-75-5, o-Nitrophenol 88-89-1 89-58-7, p-Nitroxylene 91-17-8, Decahydronaphthalene 91-20-3, Naphthalene, miscellaneous 91-20-3D, Naphthalene, diozonide derivs. 91-22-5, Quinoline, miscellaneous 91-59-8, β-Naphthylamine 91-66-7, N,N-Diethylaniline 92-52-4D, Biphenyl, chloro derivs. 92-52-4D, Biphenyl, halo derivs. 92-59-1, N-Ethyl-N-benzylaniline 92-87-5, Benzidine 93-58-3, Methyl benzoate 94-17-7, p-Chlorobenzoyl peroxide 94-36-0, Benzoyl peroxide, miscellaneous 95-48-7, miscellaneous 95-50-1, o-Dichlorobenzene 95-54-5, o-Phenylenediamine, miscellaneous 95-55-6, o-Aminophenol 95-80-7 95-85-2, 2-Amino-4-chlorophenol 96-12-8, Dibromochloropropane 96-22-0, Diethyl ketone 96-23-1 96-24-2, Glycerol α-monochlorohydrin 96-32-2, Methyl bromoacetate 96-33-3 96-34-4, Methyl chloroacetate 96-37-7, Methyl cyclopentane 96-41-3, Cyclopentanol 97-62-1, Ethyl isobutyrate 97-63-2 97-64-3, Ethyl lactate 97-72-3, Isobutyric anhydride 97-85-8, Isobutyl isobutyrate 97-86-9 97-88-1 97-95-0 97-96-1, 2-Ethylbutyraldehyde 98-00-0, Furfuryl alcohol 98-01-1, Furfural, miscellaneous 98-07-7, Benzotrichloride 98-08-8, Benzotrifluoride 98-09-9, Benzene sulfonyl chloride 98-12-4, Cyclohexyltrichlorosilane 98-13-5, Phenyltrichlorosilane 98-16-8, 3-Trifluoromethylaniline 98-82-8, Isopropylbenzene 98-83-9, miscellaneous 98-85-1, α-Methylbenzyl alcohol 98-87-3, Benzylidene chloride 98-88-4, Benzoyl chloride 98-94-2 98-95-3, Nitrobenzene, miscellaneous 99-08-1, m-Nitrotoluene 99-09-2, m-Nitroaniline 99-35-4, Trinitrobenzene 99-99-0, p-Nitrotoluene 100-00-5 100-01-6, p-Nitroaniline, miscellaneous 100-02-7, p-Nitrophenol, miscellaneous 100-17-4 100-34-5, Benzene diazonium chloride 100-36-7, N,N-Diethylethylenediamine
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)

(packaging and transport of, stds. for)
IT 100-37-8, Diethylaminoethanol 100-39-0, Benzyl bromide 100-41-4, Ethylbenzene, miscellaneous 100-42-5, miscellaneous 100-44-7, Benzyl chloride, miscellaneous 100-47-0, Benzonitrile, miscellaneous 100-50-5, 1,2,3,6-Tetrahydrobenzaldehyde 100-57-2, Phenylmercuric hydroxide 100-61-8, N-Methylaniline, miscellaneous 100-63-0, Phenylhydrazine 100-66-3, Anisole, miscellaneous 100-73-2, Acrolein dimer 101-25-7, N,N'-Dinitrosopentamethylenetetramine 101-68-8 101-77-9, 4,4'-Diaminodiphenyl methane 101-83-7, Dicyclohexylamine 102-69-2, Tripropylamine 102-70-5, Triallylamine 102-81-8, Dibutylaminoethanol 102-82-9, Tributylamine 103-65-1, n-Propylbenzene 103-69-5, N-Ethylaniline 103-71-9, Phenylisocyanate, miscellaneous 103-80-0, Phenylacetyl chloride 103-83-3, Benzyldimethylamine 104-15-4, Toluene sulfonic acid, miscellaneous 104-51-8, Butylbenzene 104-75-6, 2-Ethylhexylamine 104-78-9 104-90-5, 2-Methyl-5-ethylpyridine 105-36-2 105-37-3, Ethyl propionate 105-39-5, Ethyl chloroacetate 105-48-6, Isopropyl chloroacetate 105-54-4, Ethyl butyrate 105-56-6, Ethyl cyanoacetate 105-57-7, Acetal 105-58-8, Diethyl carbonate 105-64-6, Isopropyl peroxydicarbonate 105-74-8, Lauroyl peroxide 106-31-0, Butyric anhydride 106-44-5, p-Cresol, miscellaneous 106-46-7, p-Dichlorobenzene 106-50-3, p-Phenylenediamine, miscellaneous 106-51-4, 2,5-Cyclohexadiene-1,4-dione, miscellaneous 106-63-8, Isobutyl acrylate 106-68-3, Ethyl amyl ketone 106-88-7, 1,2-Butylene oxide 106-89-8, miscellaneous 106-92-3, Allyl glycidyl ether 106-93-4, Ethylene dibromide 106-95-6, Allyl bromide, miscellaneous 106-96-7, 3-Bromopropyne 106-97-8, Butane, miscellaneous 106-97-8D, Butane, mixts. 106-99-0, 1,3-Butadiene, miscellaneous 107-00-6, Ethylacetylene 107-02-8, 2-Propenal, miscellaneous 107-05-1, Allyl chloride 107-06-2, Ethylene dichloride, miscellaneous 107-07-3, Ethylene chlorohydrin, miscellaneous 107-10-8, Propylamine, miscellaneous 107-11-9, Allylamine 107-12-0, Propionitrile 107-13-1, Acrylonitrile, miscellaneous 107-14-2, Chloroacetonitrile 107-15-3, Ethylenediamine, miscellaneous 107-18-6, Allyl alcohol, miscellaneous 107-19-7, Propargyl alcohol 107-20-0, Chloroacetaldehyde 107-25-5, Vinylmethyl ether 107-29-9, Acetaldehyde oxime 107-30-2, Methylchloromethyl ether 107-31-3, Methyl formate 107-37-9, Allyltrichlorosilane 107-49-3, Tetraethyl pyrophosphate 107-70-0 107-71-1, tert-Butyl peroxylacetate 107-72-2, Amyltrichlorosilane 107-81-3, 2-Bromopentane 107-82-4, 1-Bromo-3-methylbutane 107-87-9, Methyl propyl ketone 107-89-1, Aldol 107-92-6, Butyric acid, miscellaneous 108-01-0, Dimethylethanolamine 108-05-4, Acetic acid ethenyl ester, miscellaneous 108-09-8, 1,3-Dimethylbutylamine 108-10-1, Methyl isobutyl ketone 108-11-2, Methyl isobutyl carbinol 108-18-9, Diisopropylamine 108-20-3, Diisopropyl ether 108-21-4, Isopropyl acetate 108-22-5, Isopropenyl acetate 108-23-6, Isopropyl chloroformate 108-24-7, Acetic anhydride 108-31-6, 2,5-Furandione, miscellaneous 108-39-4, miscellaneous 108-45-2, m-Phenylenediamine, miscellaneous 108-46-3, Resorcinol, miscellaneous 108-67-8, miscellaneous 108-77-0 108-83-8, Diisobutyl ketone 108-84-9 108-86-1, Benzene, bromo-, miscellaneous 108-87-2, Methyl cyclohexane 108-88-3, Toluene, miscellaneous 108-90-7, Chlorobenzene, miscellaneous 108-91-8, Cyclohexylamine, miscellaneous

108-94-1, Cyclohexanone, miscellaneous 108-95-2, Phenol, miscellaneous 108-98-5, Phenyl mercaptan, miscellaneous 109-02-4 109-09-1, 2-Chloropyridine 109-13-7, tert-Butyl peroxyisobutyrate 109-52-4, Valeric acid, miscellaneous 109-53-5, Vinyl isobutyl ether 109-60-4, n-Propyl acetate 109-61-5, n-Propyl chloroformate 109-63-7, Boron trifluoride diethyl etherate 109-65-9, n-Butyl bromide 109-66-0, Pentane, miscellaneous 109-70-6, 1-Chloro-3-bromopropane 109-73-9, n-Butylamine, miscellaneous 109-74-0, Butyronitrile 109-77-3, Malononitrile 109-79-5, Butyl mercaptan 109-86-4, Ethylene glycol monomethyl ether 109-87-5, Methylal 109-89-7, Diethylamine, miscellaneous 109-90-0, Ethyl isocyanate 109-92-2, Vinyl ethyl ether 109-93-3, Divinyl ether 109-94-4, Ethyl formate 109-95-5, Ethyl nitrite 109-99-9, Tetrahydrofuran, miscellaneous 110-00-9, Furan 110-01-0, Tetrahydrothiophene 110-02-1, Thiophene 110-12-3, 5-Methylhexan-2-one 110-16-7, Maleic acid, miscellaneous 110-18-9 110-19-0 110-22-5, Diacetyl peroxide 110-43-0, Amyl methyl ketone 110-49-6 110-54-3, Hexane, miscellaneous 110-58-7, Amylamine 110-62-3, Valeraldehyde 110-66-7, Amyl mercaptan 110-68-9, N-Methylbutylamine 110-69-0, Butyraldoxime 110-71-4, 1,2-Dimethoxyethane 110-74-7, Propyl formate 110-78-1, n-Propyl isocyanate 110-80-5, Ethylene glycol monoethyl ether 110-82-7, Cyclohexane, miscellaneous 110-83-8, Cyclohexene, miscellaneous 110-85-0, Piperazine, miscellaneous 110-86-1, Pyridine, miscellaneous 110-87-2 110-89-4, Piperidine, miscellaneous 110-91-8, Morpholine, miscellaneous 110-96-3, Diisobutylamine 111-15-9, Ethylene glycol monoethyl ether acetate 111-34-2, Butylvinyl ether 111-36-4, n-Butyl isocyanate 111-40-0 111-43-3, Dipropyl ether 111-49-9, Hexamethylenimine 111-65-9, Octane, miscellaneous 111-69-3, Adiponitrile 111-71-7, n-Heptaldehyde 111-76-2, Ethylene glycol monobutyl ether 111-92-2, Di-n-butylamine 112-04-9 112-24-3, Triethylenetetramine 112-57-2 115-07-1, Propylene, miscellaneous 115-10-6, Dimethyl ether 115-11-7, Isobutylene, miscellaneous 115-21-9, Ethyltrichlorosilane 115-25-3, Octafluorocyclobutane 116-14-3, Tetrafluoroethylene, miscellaneous 116-15-4, Hexafluoropropylene 116-16-5, Hexachloroacetone 116-54-1, Methyl dichloroacetate 118-74-1, Hexachlorobenzene 118-96-7, Trinitrotoluene 120-92-3, Cyclopentanone 121-43-7, Trimethyl borate 121-44-8, Triethylamine, miscellaneous 121-45-9, Trimethyl phosphite 121-46-0, 2,5-Norbornadiene 121-69-7, N,N-Dimethylaniline, miscellaneous 121-73-3 121-82-4, Cyclotrimethylenetrinitramine 122-51-0, Ethyl orthoformate 122-52-1, Triethyl phosphite 123-00-2, 4-Morpholinepropanamine 123-15-9 123-19-3, Dipropylketone 123-20-6, Vinyl butyrate 123-23-9, Succinic acid peroxide 123-30-8, p-Aminophenol 123-31-9, Hydroquinone, miscellaneous 123-38-6, Propionaldehyde, miscellaneous 123-42-2, Diacetone alcohol 123-54-6, 2,4-Pentanedione, miscellaneous 123-62-6, Propionic anhydride 123-63-7, Paraldehyde 123-72-8, Butyraldehyde 123-75-1, Pyrrolidine, miscellaneous 123-86-4, Butyl acetate 123-91-1, Dioxane, miscellaneous 124-02-7, Diallylamine 124-09-4, Hexamethylenediamine, miscellaneous 124-13-0, Octyl aldehyde 124-18-5, n-Decane 124-38-9, Carbon dioxide, miscellaneous 124-40-3, Dimethylamine, miscellaneous 124-41-4, Sodium methylate 124-43-6 124-65-2, Sodium cacodylate 126-98-7,

Methacrylonitrile 126-99-8, Chloroprene 127-18-4, Tetrachloroethylene, miscellaneous 127-85-5, Sodium arsanilate 129-79-3 131-52-2, Sodium pentachlorophenate 131-73-7, Hexanitrodiphenylamine 131-74-8, Ammonium picrate 133-14-2 133-55-1, N,N'-Dinitroso-N,N'-dimethyl terephthalamide 134-32-7, α-Naphthylamine 138-86-3, Dipentene 138-89-6 139-02-6, Sodium phenolate
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(packaging and transport of, stds. for)

IT 140-29-4, Phenylacetonitrile 140-31-8, 1-Piperazineethanamine 140-80-7 140-88-5 141-32-2 141-43-5, Ethanolamine, miscellaneous 141-57-1, Propyltrichlorosilane 141-59-3, tert-Octylmercaptan 141-75-3, Butyryl chloride 141-78-6, Ethyl acetate, miscellaneous 141-79-7, Mesityl oxide 142-04-1, Aniline hydrochloride 142-29-0, Cyclopentene 142-62-1, Hexanoic acid, miscellaneous 142-82-5, Heptane, miscellaneous 142-84-7, Dipropylamine 142-96-1, Dibutyl ether 143-33-9, Sodium cyanide 144-49-0, Fluoroacetic acid 144-62-7D, Ethanedioic acid, salts 146-84-9, Silver picrate 149-74-6, Methylphenyldichlorosilane 151-50-8, Potassium cyanide 151-56-4, Ethylenimine, miscellaneous 156-62-7, Calcium cyanamide 260-94-6, Acridine 283-66-9, Hexamethylene triperoxide diamine 287-23-0, Cyclobutane 287-92-3, Cyclopentane 291-64-5, Cycloheptane 298-00-0, Methyl parathion 298-07-7 302-01-2, Hydrazine, miscellaneous 309-00-2, Aldrin 352-93-2, Diethyl sulfide 353-36-6, Ethyl fluoride 353-42-4, Boron trifluoride dimethyl etherate 353-50-4, Carbonyl fluoride 353-59-3 354-32-5, Trifluoroacetylchloride 357-57-3, Brucine 360-89-4, Octafluorobut-2-ene 428-59-1, Hexafluoropropylene oxide 431-03-8, Butanedione 460-19-5, Cyanogen 462-06-6, Fluorobenzene 462-08-8, m-Aminopyridine 462-95-3, Diethoxymethane 463-04-7, Amyl nitrite 463-49-0, Propadiene 463-58-1, Carbonyl sulfide 463-71-8, Thiophosgene 463-82-1, 2,2-Dimethylpropane 479-45-8 501-53-1, Benzyl chloroformate 502-98-7D, salts 503-74-2, Isopentanoic acid 504-24-5, 4-Pyridinamine 504-29-0, 2-Pyridinamine 506-64-9, Silver cyanide (Ag(CN)) 506-68-3, Cyanogen bromide 506-77-4, Cyanogen chloride 506-85-4, Fulminic acid 506-93-4, Guanidine nitrate 506-96-7, Acetyl bromide 507-02-8, Acetyl iodide 507-09-5, Thioacetic acid, miscellaneous 507-70-0, Borneol 509-14-8, Tetranitromethane 512-85-6, Ascaridole 513-35-9, 2-Methyl-2-butene 513-38-2 513-42-8, Methallyl alcohol 513-48-4, 2-Iodobutane 513-86-0, Acetyl methyl carbinol 517-25-9, Trinitromethane 517-92-0, 1,8-Dihydroxy-2,4,5,7-tetranitroanthraquinone 519-44-8D, 2,4-Dinitroresorcinol, heavy metal salts 532-27-4, Chloracetophenone 533-51-7, Silver oxalate 534-07-6, 1,3-Dichloroacetone 534-15-6, 1,1-Dimethoxyethane 534-22-5, 2-Methylfuran 535-13-7, Ethyl-2-chloropropionate 540-18-1, Amyl butyrate 540-42-1, Isobutyl propionate 540-54-5, Propyl chloride 540-67-0, Ethyl methyl ether 540-73-8 540-82-9, Ethylsulfuric acid 540-84-1, Isooctane 541-41-3, Ethyl chloroformate 542-55-2, Isobutyl formate 542-62-1, Barium cyanide 542-88-1, Dichlorodimethyl ether, symmetrical 543-27-1, Isobutyl chloroformate 543-59-9, Amyl chloride 544-16-1, Butyl nitrite 544-25-2, Cycloheptatriene 544-97-8, Dimethyl zinc 545-55-1, Tris(1-aziridinyl)phosphine oxide 554-12-1, Methyl propionate 554-84-7, m-Nitrophenol **555-54-4**, Magnesium

diphenyl 556-24-1, Methyl isovalerate 556-56-9, Allyl iodide 556-61-6, Methyl isothiocyanate 556-88-7 556-89-8, Nitrourea 557-17-5, Methyl propyl ether 557-19-7, Nickel cyanide (Ni(CN)2) 557-20-0, Diethylzinc 557-21-1, Zinc cyanide 557-31-3, Allyl ethyl ether 557-40-4, Diallylether 557-98-2, 2-Chloropropene 558-13-4, Carbon tetrabromide 563-45-1, 3-Methyl-1-butene 563-46-2, 2-Methyl-1-butene 563-47-3, Methyl allyl chloride 563-80-4, 3-Methylbutan-2-one 578-54-1, 2-Ethylaniline 578-94-9, Diphenylamine chloroarsine 582-61-6, Benzoyl azide 583-15-3, Mercury benzoate 584-79-2, Allethrin 585-79-5, 1-Bromo-3-nitrobenzene 586-62-9, Terpinolene 587-85-9D, compds. 590-01-2, Butylpropionate 590-36-3, 2-Methylpentan-2-ol 591-27-5, m-Aminophenol 591-87-7, Allyl acetate 591-89-9, Mercuric potassium cyanide 592-01-8, Calcium cyanide 592-05-2, Lead cyanide (Pb(CN)2) 592-34-7, n-Butylchloroformate 592-41-6, 1-Hexene, miscellaneous 592-55-2, 2-Bromoethyl ethyl ether 592-63-2 592-84-7, n-Butylformate 593-53-3, Methyl fluoride 593-60-2, Vinyl bromide 593-89-5, Methyldichloroarsine 594-42-3, Perchloromethylmercaptan 594-72-9, 1,1-Dichloro-1-nitroethane 598-14-1, Ethyldichloroarsine 598-21-0, Bromoacetyl bromide 598-31-2, Bromoacetone 598-57-2, Methyl nitramine 598-57-2D, Methyl nitramine, metal salts 598-58-3, Methyl nitrate 598-73-2, Bromotrifluoroethylene 598-78-7, α-Chloropropionic acid 598-99-2, Methyl trichloroacetate 602-96-0, 1,3,5-Trimethyl-2,4,6-trinitrobenzene 602-99-3, Trinitro-m-cresol 602-99-3D, Methyl picric acid, heavy metal salts 608-50-4, 2,4-Dinitro-1,3,5-trimethylbenzene 610-38-8, 4-Bromo-1,2-dinitrobenzene 616-38-6, Dimethyl carbonate 616-74-0D, 4,6-Dinitroresorcinol, heavy metal salts 617-37-8 617-50-5, Isopropyl isobutyrate 617-89-0, Furfurylamine 619-97-6, Benzene diazonium nitrate 620-05-3, Benzyl iodide 622-44-6, Phenylcarbylamine chloride 622-45-7, Cyclohexyl acetate 623-42-7, Methyl butyrate 623-87-0, Glycerol-1,3-dinitrate 624-61-3, Dibromoacetylene 624-74-8, Diiodoacetylene 624-83-9, Methyl isocyanate 624-91-9, Methyl nitrite 624-92-0, Dimethyl disulfide 625-76-3, Dinitromethane 626-67-5, 1-Methylpiperidine 627-13-4, n-Propyl nitrate 627-30-5 627-63-4, Fumaryl chloride 628-28-4, Butyl methyl ether 628-32-0, Ethyl propyl ether 628-63-7, Amyl acetate 628-81-9, Ethyl butyl ether 628-86-4, Mercury fulminate 628-92-2, Cycloheptene 628-96-6, Ethylene glycol dinitrate 629-13-0, 1,2-Diazidoethane 629-14-1 629-20-9, Cyclooctatetraene 630-08-0, Carbon monoxide, miscellaneous 630-72-8, Trinitroacetonitrile 637-78-5, Isopropyl propionate 638-11-9, Isopropyl butyrate 638-29-9, Valeryl chloride 638-49-3, Amyl formate 641-16-7, 2,3,4,6-Tetranitrophenol 644-31-5, Acetyl benzoyl peroxide 644-97-3, Phenyl phosphorus dichloride 645-55-6, N-Nitroaniline 646-06-0, Dioxolane 674-81-7, Nitrosoguanidine 674-82-8, Diketene 676-83-5, Methyl phosphonous dichloride 676-97-1, Methyl phosphonic dichloride 676-98-2, Methyl phosphonothioic dichloride 677-71-4, Hexafluoroacetone hydrate 681-84-5, Methyl orthosilicate 684-16-2, Hexafluoroacetone 693-21-0, Diethylene glycol dinitrate 694-05-3, 1,2,3,6-Tetrahydropyridine 757-58-4, Hexaethyl tetraphosphate 762-12-9, Decanoyl peroxide 762-13-0, Pelargonyl peroxide 762-16-3 765-34-4, Glycidaldehyde 766-09-6, 1-Ethylpiperidine 771-29-9, Tetralin hydroperoxide 776-74-9, Diphenylmethyl bromide 814-78-8,

Methyl isopropenyl ketone 822-06-0 831-52-7, Sodium picramate 883-40-9, Diazodiphenylmethane 918-37-6, Hexanitroethane 918-54-7, Trinitroethanol 926-63-6 926-64-7, 2-Dimethylaminoacetonitrile 928-65-4, Hexyltrichlorosilane 929-06-6, 2-(2-Aminoethoxy)ethanol 993-00-0, Methylchlorosilane 993-12-4 993-43-1, Ethyl phosphonothioic dichloride 1002-16-0, Amyl nitrate 1070-19-5, tert-Butoxycarbonyl azide 1120-21-4, Undecane 1125-27-5
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IT 1126-78-9 1187-93-5, Perfluoromethyl vinyl ether 1299-86-1, Aluminum carbide 1300-64-7, Anisoyl chloride 1300-71-6, Xylenol 1300-73-8D, derivs. 1303-28-2, Arsenic pentoxide 1303-33-9, Arsenic sulfide 1303-33-9D, Arsenic sulfide, mixture with chlorates 1304-28-5, Barium oxide, miscellaneous 1304-29-6, Barium peroxide 1305-78-8, Calcium oxide, miscellaneous 1305-79-9, Calcium peroxide 1305-99-3, Calcium phosphide 1309-60-0, Lead dioxide 1310-58-3, Potassium hydroxide, miscellaneous **1310-65-2**, Lithium hydroxide 1310-73-2, Sodium hydroxide, miscellaneous 1310-82-3, Rubidium hydroxide 1312-73-8, Potassium sulfide 1313-60-6, Sodium peroxide 1313-82-2, Sodium sulfide, miscellaneous 1314-18-7, Strontium peroxide 1314-22-3, Zinc peroxide 1314-24-5, Phosphorus trioxide 1314-34-7, Vanadium trioxide 1314-56-3, Phosphorus pentoxide, miscellaneous 1314-62-1, Vanadium pentoxide, miscellaneous 1314-80-3, Phosphorus sulfide (P2S5) 1314-84-7, Zinc phosphide 1314-85-8, Phosphorus sesquisulfide 1319-77-3, Cresylic acid 1320-37-2, Dichlorotetrafluoroethane 1321-10-4, Chlorocresol 1321-31-9, Phenetidine 1327-53-3, Arsenic trioxide 1330-20-7, Xylene, miscellaneous 1330-45-6, Chlorotrifluoroethane 1330-78-5, Tricresyl phosphate 1331-22-2, Methyl cyclohexanone 1332-12-3, Fulminating gold 1332-37-2, Iron oxide, properties 1333-39-7, Phenolsulfonic acid 1333-41-1, Picoline **1333-74-0**, **Hydrogen**, miscellaneous 1333-82-0, Chromium trioxide 1333-83-1, Sodium **hydrogen** fluoride 1335-26-8, Magnesium peroxide 1335-31-5, Mercury oxycyanide 1335-85-9, Dinitro-o-cresol 1336-21-6, Ammonium hydroxide 1337-81-1 1338-23-4, Methyl ethyl ketone peroxide 1341-24-8, Chloroacetophenone 1341-49-7, Ammonium **hydrogen** fluoride 1344-40-7, Lead phosphite, dibasic 1344-67-8, Copper chloride 1498-40-4, Ethyl phosphonous dichloride 1498-51-7, Ethyl phosphorodichloridate 1569-69-3, Cyclohexyl mercaptan 1609-86-5, tert-Butyl isocyanate 1623-15-0 1623-24-1, Isopropyl acid phosphate 1634-04-4, Methyl-tert-butyl ether 1693-71-6, Triallyl borate 1705-60-8, 2,2-Di(4,4-di-tert-butylperoxycyclohexyl)propane 1712-64-7, Isopropyl nitrate 1719-53-5, Diethyldichlorosilane 1737-93-5, 3,5-Dichloro-2,4,6-trifluoropyridine 1789-58-8, Ethyldichlorosilane 1795-48-8, Isopropyl isocyanate 1838-59-1, Allyl formate 1873-29-6, Isobutyl isocyanate 1885-14-9, Phenylchloroformate 1947-27-9, Arsenic trichloride 2050-92-2, Di-n-amylamine 2094-98-6, 1,1'-Azodi(hexahydrobenzonitrile) 2144-45-8, Dibenzyl peroxydicarbonate 2155-71-7 2167-23-9, 2,2-Di(tert-butylperoxy)butane 2217-06-3, Dipicryl sulfide 2243-94-9, 1,3,5-Trinitronaphthalene 2244-21-5, Potassium dichloroisocyanurate 2294-47-5, p-Diazidobenzene 2312-76-7 2338-12-7, 5-Nitrobenzotriazole 2487-90-3, Trimethoxysilane 2508-19-2,

Trinitrobenzenesulfonic acid 2524-03-0, Dimethyl chlorothiophosphate 2524-04-1, Diethylthiophosphoryl chloride 2549-51-1, Vinyl chloroacetate 2551-62-4, Sulfur hexafluoride 2567-83-1, Tetraethylammonium perchlorate 2657-00-3, Sodium 2-diazo-1-naphthol-5-sulfonate 2691-41-0, Cyclotetramethylenetetranitramine 2696-92-6, Nitrosyl chloride 2699-79-8, Sulfuryl fluoride 2782-57-2, Dichloroisocyanuric acid 2782-57-2D, Dichloroisocyanuric acid, salts 2820-51-1, Nicotine hydrochloride 2825-15-2 2855-13-2, Isophoronediamine 2867-47-2, Dimethylaminoethyl methacrylate 2893-78-9, Sodium dichloroisocyanurate 2937-50-0, Allyl chloroformate 2941-64-2, Ethyl chlorothioformate 2980-64-5 3025-88-5, 2,5-Dimethyl-2,5-dihydroperoxy hexane 3031-74-1, Ethyl hydroperoxide 3032-55-1 3054-95-3, 3,3-Diethoxypropene 3087-37-4, Tetrapropylorthotitanate 3129-90-6, Isothiocyanic acid 3129-91-7, Dicyclohexylammonium nitrite 3132-64-7, Epibromohydrin 3165-93-3, 4-Chloro-o-toluidine hydrochloride 3173-53-3, Cyclohexyl isocyanate 3179-56-4, Acetyl cyclohexanesulfonyl peroxide 3188-13-4, Chloromethyl ethyl ether 3248-28-0, Dipropionyl peroxide 3268-49-3 3275-73-8, Nicotine tartrate 3282-30-2, Trimethylacetyl chloride 3497-00-5, Phenyl phosphorus thiodichloride 3689-24-5 3724-65-0, Crotonic acid 3811-04-9, Potassium chlorate 3926-62-3, Sodium chloroacetate 3982-91-0, Thiophosphoryl chloride 4016-11-9, 1,2-Epoxy-3-ethoxypropane 4098-71-9 4109-96-0, Dichlorosilane 4170-30-3, Crotonaldehyde 4300-97-4 4316-42-1, N-n-Butylimidazole 4419-11-8, 2,2'-Azodi(2,4-dimethylvaleronitrile) 4421-50-5 4435-53-4, Butoxyl 4452-58-8, Sodium percarbonate 4472-06-4, Carbonazidodithioic acid 4484-72-4, Dodecyltrichlorosilane 4528-34-1 4547-70-0 4591-46-2 4682-03-5, Diazodinitrophenol 4795-29-3, Tetrahydrofurfurylamine 4904-61-4, 1,5,9-Cyclododecatriene 5283-66-9, Octyltrichlorosilane 5283-67-0, Nonyltrichlorosilane 5329-14-6, Sulfamic acid 5419-55-6, Triisopropyl borate 5610-59-3, Silver fulminate 5637-83-2, Cyanuric triazide 5653-21-4 5894-60-0, Hexadecyltrichlorosilane 5970-32-1, Mercury salicylate 6023-29-6 6275-02-1 6423-43-4 6427-21-0, Methoxymethyl isocyanate 6484-52-2, Nitric acid ammonium salt, properties 6484-52-2D, Ammonium nitrate, mixts. with **fuel oils** 6505-86-8, Nicotine sulfate 6659-60-5, 1,2,4-Butanetriol trinitrate 6842-15-5, Propylene tetramer 7304-92-9 7332-16-3, Inositol hexanitrate 7429-90-5, Aluminum, miscellaneous 7429-90-5D, Aluminum, alkyl derivs. 7439-90-9, Krypton, miscellaneous 7439-92-1D, Lead, compds. 7439-93-2, Lithium, miscellaneous 7439-93-2D, Lithium, alkyl derivs. 7439-95-4, Magnesium, miscellaneous 7439-95-4D, Magnesium, alkyl derivs. 7439-97-6, Mercury, miscellaneous 7439-97-6D, Mercury, compds. 7440-01-9, Neon, miscellaneous 7440-09-7, Potassium, miscellaneous 7440-17-7, Rubidium, miscellaneous 7440-21-3, Silicon, miscellaneous 7440-23-5, Sodium, miscellaneous 7440-28-0D, Thallium, compds. 7440-29-1, Thorium, miscellaneous 7440-31-5D, Tin, organic compds. 7440-32-6, Titanium, properties 7440-36-0, Antimony, miscellaneous 7440-36-0D, Antimony, inorg. and organic compds. 7440-37-1, Argon, miscellaneous 7440-38-2, Arsenic, miscellaneous 7440-39-3, Barium, miscellaneous 7440-39-3D, Barium, alloys 7440-39-3D, Barium, compds. 7440-41-7, Beryllium, miscellaneous 7440-41-7D, Beryllium, compds. 7440-43-9D, Cadmium, compds. 7440-44-0, Carbon, miscellaneous 7440-45-1, Cerium,

miscellaneous 7440-46-2, Cesium, miscellaneous 7440-55-3, Gallium, miscellaneous 7440-58-6, Hafnium, miscellaneous 7440-59-7, Helium, miscellaneous 7440-61-1, Uranium, miscellaneous 7440-63-3, Xenon, miscellaneous 7440-66-6, Zinc, miscellaneous 7440-67-7, Zirconium, miscellaneous 7440-70-2, Calcium, miscellaneous 7440-70-2D, Calcium, alloys 7446-09-5, Sulfur dioxide, miscellaneous 7446-11-9, Sulfur trioxide, miscellaneous 7446-14-2, Lead sulfate 7446-18-6, Thallium sulfate 7446-70-0, Aluminum chloride (AlCl3), miscellaneous 7487-94-7, Mercuric chloride, miscellaneous 7488-56-4, Selenium disulfide 7521-80-4, Butyltrichlorosilane 7550-45-0, Titanium tetrachloride, miscellaneous 7570-26-5, 1,2-Dinitroethane 7572-29-4, Dichloroacetylene 7578-36-1 **7580-67-8**, **Lithium hydride** 7601-89-0, Sodium perchlorate 7601-90-3, Perchloric acid, miscellaneous 7616-94-6, Perchloryl fluoride 7631-89-2, Sodium arsenate 7631-99-4, Sodium nitrate, miscellaneous 7632-00-0, Sodium nitrite 7632-51-1, Vanadium tetrachloride 7637-07-2, Boron trifluoride, miscellaneous 7645-25-2, Lead arsenate 7646-69-7, Sodium hydride 7646-78-8, Stannic chloride, miscellaneous 7646-85-7, Zinc chloride, miscellaneous 7646-93-7, Potassium **hydrogen** sulfate 7647-01-0, **Hydrogen** chloride, miscellaneous 7647-18-9, Antimony pentachloride 7647-19-0, Phosphorus pentafluoride
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IT 7664-38-2, Phosphoric acid, miscellaneous 7664-38-2D, Phosphoric acid, esters 7664-39-3, **Hydrogen** fluoride, miscellaneous 7664-41-7, Ammonia, miscellaneous 7664-93-9, Sulfuric acid, miscellaneous 7681-38-1, Sodium **hydrogen** sulfate 7681-49-4, Sodium fluoride, miscellaneous 7681-52-9, Sodium hypochlorite 7697-37-2, Nitric acid, miscellaneous 7704-34-9, Sulfur, miscellaneous 7705-07-9D, Titanium trichloride, mixts. 7705-08-0, Ferric chloride, miscellaneous 7718-98-1, Vanadium trichloride 7719-09-7, Thionyl chloride 7719-12-2, Phosphorus trichloride 7722-64-7, Potassium permanganate 7722-84-1, **Hydrogen** peroxide (H2O2), miscellaneous 7723-14-0, Phosphorus, miscellaneous 7726-95-6, Bromine, miscellaneous 7727-15-3, Aluminum bromide 7727-18-6, Vanadium oxytrichloride 7727-21-1, Potassium persulfate 7727-37-9, Nitrogen, miscellaneous 7727-37-9D, Nitrogen, mixts. with rare gases 7727-54-0, Ammonium persulfate 7738-94-5, Chromic acid (H2CrO4) 7756-94-7, Triisobutylene 7757-79-1, Potassium nitrate, miscellaneous 7758-01-2, Potassium bromate 7758-09-0, Potassium nitrite 7758-19-2, Sodium chlorite 7758-94-3, Ferrous chloride 7761-88-8, Silver nitrate, miscellaneous 7773-03-7, Potassium bisulfite 7775-09-9, Sodium chlorate 7775-14-6, Sodium dithionite 7778-39-4, Arsenic acid 7778-44-1, Calcium arsenate 7778-54-3, Calcium hypochlorite 7778-66-7 7778-74-7, Potassium perchlorate 7779-86-4, Zinc dithionite 7779-88-6, Zinc nitrate 7782-39-0, Deuterium, miscellaneous 7782-41-4, Fluorine, miscellaneous 7782-44-7, Oxygen, miscellaneous 7782-44-7D, Oxygen, mixts. with rare gases 7782-49-2, Selenium, miscellaneous 7782-50-5, Chlorine, miscellaneous 7782-65-2, Germane 7782-78-7, Nitrosylsulfuric acid 7782-79-8D, Hydrazoic acid, copper complexes 7782-99-2, Sulfurous acid, miscellaneous 7783-06-4, **Hydrogen** sulfide, miscellaneous

7783-07-5, **Hydrogen** selenide (H2Se) 7783-08-6, Selenic acid 7783-33-7 7783-41-7, Oxygen difluoride 7783-54-2, Nitrogen trifluoride 7783-56-4, Antimony trifluoride 7783-60-0, Sulfur tetrafluoride 7783-61-1, Silicon tetrafluoride 7783-66-6, Iodine pentafluoride 7783-70-2, Antimony pentafluoride 7783-79-1, Selenium hexafluoride 7783-80-4, Tellurium hexafluoride 7783-81-5, Uranium hexafluoride 7783-82-6, Tungsten hexafluoride 7783-91-7, Silver chlorite 7784-08-9 7784-21-6, Aluminum hydride 7784-30-7, Aluminum phosphate 7784-42-1, Arsine 7784-46-5, Sodium arsenite 7786-30-3D, Magnesium chloride (MgCl2), mixture with chlorates 7787-36-2, Barium permanganate 7787-41-9, Barium selenate 7787-71-5, Bromine trifluoride 7788-97-8, Chromic fluoride 7789-09-5, Ammonium dichromate 7789-18-6, Cesium nitrate 7789-21-1, Fluorosulfonic acid 7789-23-3, Potassium fluoride 7789-29-9, Potassium bifluoride 7789-30-2, Bromine pentafluoride 7789-38-0, Sodium bromate 7789-59-5, Phosphorus oxybromide 7789-60-8, Phosphorus tribromide 7789-61-9, Antimony tribromide 7789-69-7, Phosphorus pentabromide 7789-78-8, Calcium hydride 7790-59-2 **7790-69-4**, Lithium nitrate 7790-91-2, Chlorine trifluoride 7790-93-4, Chloric acid 7790-94-5, Chlorosulfonic acid 7790-98-9, Ammonium perchlorate 7790-99-0, Iodine monochloride 7791-10-8, Strontium chlorate 7791-23-3, Selenium oxychloride 7791-25-5, Sulfuryl chloride 7791-27-7, Disulfuryl chloride 7803-51-2, Phosphine 7803-52-3, Stibine **7803-54-5**, Magnesium diamide 7803-55-6, Ammonium metavanadate 7803-57-8, Hydrazine hydrate 7803-62-5, Silane, miscellaneous 7803-63-6, Ammonium **hydrogen** sulfate 8004-09-9 8006-19-7, Amatol 8006-28-8, Soda lime 8007-56-5, Nitrohydrochloric acid 8007-58-7 8012-74-6, London Purple 8014-95-7, Fuming sulfuric acid 8049-17-0, Ferrosilicon 8050-88-2, Celluloid 8063-77-2 8065-53-0, Hexolite 8066-33-9, Pentolite 8070-50-6 9003-53-6, Polystyrene 9004-70-0, Collodion 9056-38-6, Nitrostarch 9080-17-5, Ammonium polysulfide 10022-31-8, Barium nitrate 10024-97-2, Nitrogen oxide (N2O), properties 10025-78-2, Trichlorosilane 10025-85-1, Nitrogen trichloride 10025-87-3, Phosphorus oxychloride 10025-91-9, Antimony trichloride 10026-04-7, Silicon tetrachloride 10026-11-6, Zirconium tetrachloride 10026-13-8, Phosphorus pentachloride 10031-13-7 10031-87-5, 2-Ethylbutyl acetate **10034-81-8**, Magnesium perchlorate 10034-85-2, **Hydrogen** iodide 10035-10-6, **Hydrogen** bromide, miscellaneous 10039-54-0, Hydroxylamine sulfate 10042-76-9, Strontium nitrate 10045-94-0, Mercuric nitrate 10049-04-4, Chlorine dioxide 10099-74-8, Lead nitrate 10101-50-5 10102-06-4, Uranyl nitrate 10102-12-2, Selenium nitride 10102-18-8, Sodium selenite 10102-43-9, Nitric oxide, miscellaneous 10102-44-0, Nitrogen dioxide, miscellaneous 10102-49-5, Ferric arsenate 10102-50-8, Ferrous arsenate **10103-50-1**, Magnesium arsenate 10118-76-0 10124-37-5, Calcium nitrate 10124-48-8, Mercury ammonium chloride 10124-50-2, Potassium arsenite 10137-74-3, Calcium chlorate 10192-29-7, Ammonium chlorate 10241-05-1, Molybdenum pentachloride 10256-53-8, Methanamine, compound with trinitromethane, miscellaneous 10294-33-4, Boron tribromide 10294-34-5, Boron trichloride 10306-83-9 **10326-21-3**, Magnesium chlorate 10326-24-6 10361-95-2, Zinc chlorate **10377-60-3**, Magnesium nitrate 10377-66-9, Manganese nitrate 10415-75-5, Mercurous nitrate 10421-48-4, Ferric nitrate

10431-47-7 10544-63-5, Ethyl crotonate 11069-19-5, Dichlorobutene 11071-47-9, Isooctene 11099-22-2 11105-16-1, Zirconium hydride 11122-26-2 11135-81-2 11138-49-1, Sodium aluminate 11140-68-4, Titanium hydride **12001-29-5**, Chrysotile 12002-19-6, Mercury nucleate 12002-48-1, Trichlorobenzene 12030-88-5, Potassium superoxide 12031-80-0, Lithium peroxide 12033-49-7, Nitrogen trioxide 12034-12-7, Sodium superoxide 12057-74-8, Magnesium phosphide (Mg3P2) 12125-01-8, Ammonium fluoride 12135-76-1, Ammonium sulfide 12136-15-1, Mercury nitride 12164-94-2, Ammonium azide 12167-20-3, Nitrocresol **12172-67-7**, Actinolite 12401-70-6, Potassium monoxide 12401-86-4, Sodium monoxide 12427-38-2, Maneb 12440-42-5, Tin phosphide (Sn3P4) 12504-16-4, Strontium phosphide (Sr3P2) 12627-52-0, Antimony sulfide 12627-52-0D, Antimony sulfide, mixture with chlorates 12640-89-0, Selenium oxide 12653-71-3, Mercury oxide 12737-18-7, Calcium silicide 12751-03-0, Cordite 12771-08-3, Sulfur chloride 12789-46-7, Amyl acid phosphate 13092-75-6, Silver acetylide 13138-45-9 13225-10-0, α-Methylglucoside tetranitrate 13319-75-0, Boron trifluoride dihydrate 13410-01-0, Sodium selenate 13424-46-9, Lead azide 13426-91-0, Cupriethylenediamine 13437-80-4, Mercuric arsenate 13444-85-4, Nitrogen triiodide 13446-10-1, Ammonium permanganate 13446-48-5, Ammonium nitrite 13450-97-0, Strontium perchlorate 13453-30-0, Thallium chlorate 13463-39-3, Nickel carbonyl 13463-40-6, Iron pentacarbonyl 13464-33-0, Zinc arsenate 13464-58-9D, Arsenous acid, copper complexes 13465-73-1, Bromosilane 13465-95-7, Barium perchlorate 13472-08-7 13473-90-0, Aluminum nitrate 13477-00-4, Barium chlorate 13477-10-6, Barium hypochlorite 13477-36-6, Calcium perchlorate 13520-83-7, Uranyl nitrate hexahydrate 13537-32-1, Fluorophosphoric acid 13548-38-4, Chromium nitrate 13597-54-1, Zinc selenate
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(packaging and transport of, stds. for)

IT 13597-99-4, Beryllium nitrate 13598-36-2, Phosphonic acid 13637-63-3, Chlorine pentafluoride 13637-76-8, Lead perchlorate 13718-59-7 13746-89-9, Zirconium nitrate 13762-51-1, Potassium borohydride 13766-44-4, Mercury sulfate 13769-43-2, Potassium metavanadate 13770-96-2, Sodium aluminum hydride **13774-25-9** 13779-41-4, Difluorophosphoric acid 13780-03-5, Calcium bisulfite 13823-29-5, Thorium nitrate **13840-33-0**, Lithium hypochlorite **13840-33-0D**, Lithium hypochlorite, mixts. 13843-59-9, Ammonium bromate 13863-88-2, Silver azide 13967-90-3, Barium bromate 13973-87-0, Bromine azide 13973-88-1, Chlorine azide 13987-01-4, Tripropylene 14014-86-9 14019-91-1, Calcium selenate 14293-73-3 14448-38-5, Hyponitrous acid 14519-07-4, Zinc bromate **14519-17-6**, Magnesium bromate 14546-44-2, Hydrazine azide **14567-73-8**, Tremolite 14644-61-2, Zirconium sulfate 14666-78-5, Diethylperoxydicarbonate 14674-72-7, Calcium chlorite 14696-82-3, Iodine azide (I(N3)) 14977-61-8 15195-06-9 15245-44-0, Lead trinitroresorcinate 15347-57-6, Lead acetate 15457-98-4 15512-36-4, Calcium dithionite 15545-97-8, 2,2'-Azodi(2,4-dimethyl-4-methoxyvaleronitile) 15598-34-2, Pyridine perchlorate 15718-71-5, Ethylenediamine diperchlorate 15825-70-4, Mannitol hexanitrate

15875-44-2, Methylamine perchlorate 16215-49-9, Di-n-butyl peroxydicarbonate 16229-43-9, Vanadyl sulfate 16339-86-9 16646-35-8 16721-80-5, Sodium hydrosulfide 16753-36-9, Copper acetylide **16853-85-3**, Lithium aluminum hydride 16871-71-9, Zinc fluorosilicate 16871-90-2, Potassium fluorosilicate 16872-11-0 16893-85-9, Sodium fluorosilicate 16901-76-1, Thallium nitrate 16919-19-0, Ammonium fluorosilicate 16940-66-2, Sodium borohydride 16940-81-1, Hexafluorophosphoric acid 16941-12-1, Chloroplatinic acid **16949-15-8**, Lithium borohydride 16949-65-8, Magnesium fluorosilicate 16961-83-4, Fluorosilicic acid 16962-07-5, Aluminum borohydride 17014-71-0, Potassium peroxide 17068-78-9, Anthophyllite 17462-58-7, sec-Butyl chloroformate 17639-93-9, Methyl-2-chloropropionate 17687-37-5, Urea nitrate 17702-41-9, Decaborane 17861-62-0 18130-44-4, Titanium sulfate 18414-36-3 18810-58-7, Barium azide 19159-68-3 19287-45-7, Diborane 19287-45-7D, Diborane, mixts. 19624-22-7, Pentaborane 20062-22-0 20236-55-9, Barium styphnate 20600-96-8 20816-12-0, Osmium tetroxide 20820-44-4 20859-73-8, Aluminum phosphide 21351-79-1, Cesium hydroxide (Cs(OH)) 21569-01-7 21723-86-4 21985-87-5, Pentanitroaniline 22128-62-7, Chloromethylchloroformate 22750-93-2, Ethyl perchlorate 22751-24-2 22826-61-5 23414-72-4, Zinc permanganate 23745-86-0, Potassium fluoroacetate 24167-76-8, Sodium phosphide 24468-13-1, 2-Ethylhexylchloroformate 24884-69-3 25013-15-4, Vinyl toluene 25109-57-3 25134-21-8 25136-55-4, Dimethyldioxane 25154-42-1, Chlorobutane 25154-54-5, Dinitrobenzene 25155-15-1, Cymene 25167-20-8, Tetrabromoethane 25167-67-3, Butylene 25167-70-8, Diisobutylene 25167-80-0, Chlorophenol 25168-05-2, Chlorotoluene 25265-68-3, Methyltetrahydrofuran 25321-14-6, Dinitrotoluene 25322-01-4, Nitropropane 25322-20-7, Tetrachloroethane 25323-30-2, Dichloroethylene 25339-56-4, Heptene 25340-17-4, Diethylbenzene 25377-72-4, n-Amylene 25496-08-6, Fluorotoluene 25497-28-3, Difluoroethane 25497-29-4, Chlorodifluoroethane 25513-64-8 25550-53-2 25550-55-4, Dinitrosobenzene 25550-58-7, Dinitrophenol 25550-58-7D, Dinitrophenol, salts 25567-67-3, Chlorodinitrobenzene 25567-68-4, Chloronitrotoluene 25639-42-3, Methylcyclohexanol 25721-38-4, Lead picrate 25917-35-5, Hexanol 26134-62-3, Lithium nitride 26140-60-3D, Terphenyl, halo derivs. 26249-12-7, Dibromobenzene 26471-56-7, Dinitroaniline 26471-62-5, Toluene diisocyanate 26506-47-8, Copper chlorate 26571-79-9 26618-70-2 26628-22-8, Sodium azide 26638-19-7, Dichloropropane 26645-10-3 26760-64-5, Isopentene 26762-93-6 26914-02-3, Iodopropane 26915-12-8, Toluidine 26952-23-8, Dichloropropene 26952-42-1, Trinitroaniline 27134-26-5, Chloroaniline 27134-27-6, Dichloroaniline 27137-85-5, Dichlorophenyltrichlorosilane 27152-57-4 27176-87-0, Dodecylbenzenesulfonic acid 27195-67-1, Dimethylcyclohexane 27215-10-7 27236-46-0, Isohexene 27254-36-0, Nitronaphthalene 27458-20-4, Butyltoluene 27978-54-7, Hydrazine perchlorate 27986-95-4 27987-06-0, Trifluoroethane 28260-61-9, Trinitrochlorobenzene 28300-74-5, Antimony potassium tartrate 28324-52-9, Pinane hydroperoxide 28479-22-3 28653-16-9 28679-16-5, Trimethylhexamethylenediisocyanate 28805-86-9, Butylphenol 29191-52-4, Anisidine 29306-57-8 29790-52-1, Nicotine salicylate 29903-04-6 29965-97-7, Cyclooctadiene

30236-29-4, Sucrose octanitrate 30525-89-4, Paraformaldehyde
30553-04-9, Naphthylthiourea 30586-10-8, Dichloropentane 30586-18-6,
Pentamethylheptane 31058-64-7 31212-28-9, Nitrobenzenesulfonic acid
33453-96-2 33864-17-4 34216-34-7, Trimethylcyclohexylamine
35296-72-1, Butanol 35860-50-5, Trinitrobenzoic acid 35860-51-6,
Dinitroresorcinol 35884-77-6, Xylyl bromide 36472-34-1, Chloropropene
37020-93-2, Mercury cyanide (Hg(CN)) 37187-22-7, Acetyl acetone peroxide
37206-20-5, Methyl isobutyl ketone peroxide 37273-91-9, Metaldehyde
37320-91-5, Mercury iodide 37368-10-8, Aluminum vanadium oxide
38139-71-8, Bromide chloride 38232-63-2, Mercurous azide 38483-28-2,
Methylene glycol dinitrate 39377-49-6, Copper cyanide 39377-56-5, Lead
sulfide 39404-03-0, Magnesium silicide 39409-64-8, TVOPA 39432-81-0
39455-80-6, Ammonium sodium vanadium oxide **39990-99-3**, Lithium
acetylide ethylenediamine complex 40058-87-5, Isopropyl-2-
chloropropionate 41195-19-1 41587-36-4, Chloronitroaniline
42296-74-2, Hexadiene 43133-95-5, Methylpentane 50815-73-1
50874-93-6 51006-59-8 51023-22-4, Trichlorobutene 51064-12-1
51312-23-3, Mercury bromide 51317-24-9, Lead nitroresorcinate
51325-42-9, Copper selenite 51845-86-4, Ethyl borate 52181-51-8
53014-37-2, Tetranitroaniline 53408-91-6, Mercury thiocyanate
53422-49-4 53569-62-3 53839-08-0 53906-68-6 54141-09-2,
1,4,-Butynediol 54413-15-9, Tritonal 54727-89-8 54958-71-3
55510-04-8, Dinitroglycoluril 55810-17-8 56929-36-3 56960-91-9
57607-37-1, Octolite 58164-88-8, Antimony lactate 58499-37-9
58933-55-4
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering
or chemical process); BIOL (Biological study); PROC (Process)
(packaging and transport of, stds. for)

IT 59753-21-8 59917-23-6 60168-33-4 **60616-74-2**,
Magnesium hydride 60869-68-3 60999-18-0 61061-91-4
61878-56-6 63085-06-3 63283-80-7, Dichloroisopropyl ether
63597-41-1, Octadiene 63885-01-8 63907-41-5 63937-14-4 63938-10-3,
Chlorotetrafluoroethane 63988-31-8 64173-96-2 64973-06-4, Arsenic
bromide 66634-68-2 67632-66-0 68833-55-6, Mercury acetylide
(Hg(C2H)) 68848-64-6 68975-47-3, Isoheptene 69523-06-4, Ferrocerium
69782-73-6 70027-50-8, Copper selenate 70042-58-9,
tert-Butylcyclohexylchloroformate 70268-38-1 70268-40-5 70281-33-3
70288-87-8 70288-89-0 70399-13-2, Lithium ferrosilicon 72672-48-1
73506-32-8, Hydrazine selenate 76080-77-8 77851-23-1 78369-83-2
79869-58-2, Propanethiol 81228-87-7, Cyclobutylchloroformate
82280-63-5 83267-52-1 84002-64-2 87686-42-8 90920-71-1
95332-73-3 98130-51-9 98205-29-9 100920-70-5 102437-81-0
105185-95-3 105554-30-1 109259-85-0 118833-38-8 125227-17-0
127795-79-3, Ammonium arsenate 131566-30-8, Potassium phosphide
132052-03-0, Pesticide S 134009-81-7, Fulminating platinum
134010-02-9, Fulminating silver 134115-62-1 134115-63-2,
Piperazinedipropanamine 134115-64-3 134115-65-4 134115-66-5
134115-68-7 134115-69-8 134115-70-1 134115-70-1D, salts
134115-71-2 134115-72-3 134115-73-4 134115-74-5 134115-75-6
134115-76-7 134140-03-7 134140-11-7 134170-48-2 134191-17-6,
Azaurolic acid 134191-62-1 134206-87-4 134206-88-5, Sodium
chlorate-dinitrotoluene mixture 134206-89-6 134207-07-1 134226-92-9

134265-01-3 134282-14-7, Ammonium fulminate 134282-15-8 134282-16-9, 5-Azido-1-hydroxytetrazole 134282-17-0 134282-18-1 134282-19-2 134282-20-5 134282-21-6 134282-23-8, 1,9-Dinitroxypentamethylene-2,4,6,8-tetramine 134282-24-9 134282-25-0 134282-26-1 134282-27-2 134282-28-3 134282-30-7 134282-30-7D, salts 134282-31-8 134282-34-1 134282-35-2 134282-37-4 134282-38-5 134282-39-6 134282-40-9 134282-41-0 134282-42-1, 2,4,6-Trinitrophenyl guanidine 134282-43-2 134293-21-3 134293-22-4 134293-23-5 134293-24-6, 2,3,5,6-Tetranitroso-1,4-dinitrobenzene 134309-18-5 134318-55-1 134318-56-2 134356-41-5 134884-20-1, Aluminum magnesium phosphide 135072-82-1 135099-37-5 135991-25-2, Galactan trinitrate 135991-28-5 135991-41-2 135991-57-0
RL: ADV (Adverse effect, including toxicity); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(packaging and transport of, stds. for)

IT 78-11-5P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

L49 ANSWER 26 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1987:608528 CAPLUS
DN 107:208528
ED Entered STN: 27 Nov 1987
TI Solid **hydrogen**/deuterium gas **generators**
IN Artz, Glen D.; Grant, Louis R.
PA United States Dept. of the Army, USA
SO U.S., 9 pp.
CODEN: USXXAM
DT Patent
LA English
IC ICM C01B003-04
ICS C06B027-00
NCL 252188250
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 49
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 4673528	A	19870616	US 1985-781820	19850930
PRAI US 1985-781820		19850930		

AB Thermally stable compns. for generating **H2** or D2 gases are described which comprise Mg borohydride diammoniate or its deuterated analog as the **H2** or D2 source 80-90, an oxidizer selected from LiNO3 and KNO3 5-15, and a polytetrafluoroethylene binder 2-15 weight%. Use of the **H2** or D2 **produced** as laser **fuels** is indicated.
ST **hydrogen generation** solid source; deuterium generation solid source; magnesium borohydride diammoniate **hydrogen** source; ammoniate magnesium borohydride **hydrogen** source
IT Lasers
(**hydrogen** or deuterium gases for, solid compns. for

generation of)
IT 9002-84-0, Polytetrafluoroethylene
RL: PRP (Properties)
(binder, for solid compns. for **generating hydrogen** or deuterium gases for lasers)
IT **97881-87-3D**, deuterated
RL: PRP (Properties)
(deuterium gas generation from solid composition containing, for lasers)
IT **1333-74-0P**, **Hydrogen**, preparation 7782-39-0P, Deuterium, uses and miscellaneous
RL: PREP (Preparation)
(**generation** of, solid compns. for, for lasers)
IT **97881-87-3**
RL: PRP (Properties)
(**hydrogen** gas **generation** from solid composition containing, for lasers)
IT 7757-79-1, Potassium nitrate, uses and miscellaneous
RL: USES (Uses)
(oxidizer, for solid compns. for **generating hydrogen** or deuterium gases for lasers)
IT **7790-69-4**, Lithium nitrate
RL: PRP (Properties)
(oxidizer, for solid compns. for **generating hydrogen** or deuterium gases for lasers)

L49 ANSWER 27 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1987:179644 CAPLUS
DN 106:179644
ED Entered STN: 29 May 1987
TI **Hydrogen energy** releasing catalyst
IN Berenyi, Szilard
PA Fusion Aided Combustion Technology International Corp., USA
SO Eur. Pat. Appl., 23 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM C10L001-18
ICS C10L001-14
CC 51-12 (Fossil Fuels, Derivatives, and Related Products)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 216635	A1	19870401	EP 1986-307306	19860923
	R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE				
	US 4668247	A	19870526	US 1985-780090	19850925
	CA 1271329	A1	19900710	CA 1986-515917	19860813
	AU 8661708	A1	19870326	AU 1986-61708	19860821
	AU 576164	B2	19880811		
	JP 62072786	A2	19870403	JP 1986-205729	19860901
	JP 03075600	B4	19911202		
	CN 86106323	A	19870325	CN 1986-106323	19860917
	CN 1012178	B	19910327		

IL 80137 A1 19901105 IL 1986-80137 19860924
BR 8705797 A 19890523 BR 1987-5797 19871030
PRAI US 1985-780090 19850925
AB The title catalyst for harnessing the H **energy** of a hydrocarbon **fuel** contains 10-90 weight% liposol. organometallic compound and 10-90 weight% **oil**-based vehicle or diluent **oil.** The liposol. organometallic compound consists of organometallic Li 6-50, organometallic Mg 3-30, and organometallic Al 1-10 weight%. The catalyst is added to a **fuel** at a specified catalyst-**fuel** ratio according to the type of **fuel** and the combustion device used. In the case of a gasoline or diesel internal-**combustion engine**, the mileage increased by 15-35%; in a furnace or boiler, the **fuel** efficiency increased by 20-35%. A typical catalyst contained Li stearate 20, Mg stearate 10, Al stearate 5, mineral **oil** 57, and Si-based synthetic **oil** 8 weight%; when added at 1:1000 catalyst-gasoline weight ratio in an engine test, the mileage increased by 31%.
ST **hydrogen energy** releasing combustion catalyst; organometallic lithium **hydrogen energy** releasing; magnesium aluminum stearate combustion catalyst; gasoline combustion additive; diesel **fuel** combustion additive
IT Combustion catalysts
(lithium stearate-containing, for hydrocarbon **fuels**)
IT Combustion catalysts
(organometallic lithium-based, for hydrocarbon **fuels**)
IT **557-04-0**, Magnesium stearate 637-12-7, Aluminum stearate **4485-12-5**, Lithium stearate
RL: CAT (Catalyst use); USES (Uses)
(combustion catalysts containing, for hydrocarbon **fuels**)

L49 ANSWER 28 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1982-68085E [32] WPIX
TI Compsn. for **generating hydrogen** or its isotopes - comprising mixture of metal hydride with inorganic ammonium or hydrazinium salt.
DC A97 E36 K05
IN BARBER, W H; BECKERT, W F; BOWEN, R E; DENGEL, O H
PA (USNA) US SEC OF NAVY
CYC 1
PI US 4341651 A 19820727 (198232)* 5
PRAI US 1980-181526 19800826
IC C01B001-07
AB US 4341651 A UPAB: 19930915
A compsn. for **generating hydrogen** and/or its isotopes comprises either (a) a metal hydride (I), selected from **hydrides** of **Li**, **Mg**, Ca and/or Na, and an ammonium or hydrazinium salt (II) of an inorganic acid anion selected from Cl, Br, I, NO3, SO4, PO4, ClO4 and their mixts.; or (B) hydride (I), salt (II) in an amount from stoichiometric to 50% excess, and (III) a mixed metal hydride selected from LiBH4, NaBH4, LiAlH4 and NaAlH4 in an amount of 5-10 weight%.
At least one of the components of compsn. (b) may be coated with polystyrene, polyethylene, polybutadiene, polycarbonate and polyhydroxyvinyl; and a binder and plasticiser and/or a metal powder may

also be present.
The compsn. provides a convenient storable source of **hydrogen**, denterium etc. e.g. for **fuel** cells or for chemical lasers. The gas is supplied rapidly, at low temperature, at reasonable cost and in high purity. The inclusion of (III) further reduces the gas production temperature without significantly decreasing the other advantages.

FS CPI
FA AB
MC CPI: A12-W11; E05-R; E31-A; E31-C; E31-H05; E31-K05; E31-Q; E32-A; K04-C; K05-B05A

L49 ANSWER 29 OF 34 COMPENDEX COPYRIGHT 2004 EEI on STN
AN 1982(11):145874 COMPENDEX DN 821198184; *8249167
TI **HYDROGEN** AS A FUTURE EM DASH **ENERGY** ALTERNATIVE.
AU Yonezawa, Teijiro (Kyoto Univ, Jpn)
SO Nenryo Kyokai Shi v 61 n 659 Mar 1982 p 158-168
CODEN: NENKAU ISSN: 0369-3775
PY 1982
LA Japanese
AB Stressing the significance of **hydrogen** as a future **energy** alternative this review briefly summarizes the thermochemical, electrolytic and some innovative methods of **hydrogen production** including biological solar **energy** conversion.Molecular orbital data is presented which is essential to understanding the physical and chemical properties of water and its behavior in chemical reactions leading to **hydrogen** evolution.Some comments are made on **hydrogen** storage systems using metal **hydrides**, condensed aromatic hydrocarbons and **magnesium** clusters.18 refs.In Japanese.
CC 521 Combustion & Fuels; 522 Gas Fuels
CT ***HYDROGEN FUELS**:Reviews

L49 ANSWER 30 OF 34 COMPENDEX COPYRIGHT 2004 EEI on STN DUPLICATE 3
AN 1982(11):148931 COMPENDEX DN *8263409; 821199437
TI PROPERTIES AND APPLICATIONS OF METAL HYDRIDES IN **ENERGY** CONVERSION SYSTEMS.
AU Wenzl, H. (Kernforschungsanlage Juelich, Ger)
SO Int Met Rev v 27 n 3 1982 p 140-168
CODEN: IMERDA ISSN: 0308-4590
PY 1982
LA English
AB Structural, thermodynamic, and kinetic properties and phase diagrams of **hydrogen** in metals and alloys are presented in relation to **hydrogen energy** technology.Special attention is paid to the **hydrides** of **Li**, **Mg**, Y, V, Nb, U, TiFe, and LaNi5.It is shown how these materials are utilized for the **production** of **hydrogen** by water splitting, stationary and mobile storatge, heat pumps and heat storage, heat engines, fushion reactor technology, and **hydrogen** isotope **separation**.161 refs.
CC 531 Metallurgy & Metallography; 901 Engineering Profession; 521 Combustion & Fuels; 641 Heat & Thermodynamics

CT *METALS AND ALLOYS:Gases; **ENERGY** STORAGE
ET Li; Mg; Y; V; Nb; U; Fe*Ti; Fe sy 2; sy 2; Ti sy 2; TiFe; Ti cp; cp; Fe cp; La*Ni; La sy 2; Ni sy 2; LaNi5; La cp; Ni cp

L49 ANSWER 31 OF 34 METADEX COPYRIGHT 2004 CSA on STN
AN 1979(6):72-150 METADEX
TI Hydrides for **Energy** Storage.
AU Andresen, A.F.; Maeland, A.J.
SO Pergamon Press. Elmsford, N.Y. 10523. 1978. Pp 599, 63/4 x 10 in., Illustrated, dollars U.S. 60.00
Conference: Geilo, Norway, 14-19 Aug. 1977
DT Conference
LA English
AB Contents include: G.G. LIBOWITZ, "The Prospects of **Carrier** for the Future"; A.J. MAELAND, "Survey of the Different Hydrides"; W.E. WALLACE and S.K. MALIK, "Structure and Hydrides"; T.B. FLANAGAN, "Thermodynamics of Metal, Alloy and Intermetallic/**Hydrogen** Systems"; A.F. ANDRESEN, "Structural Hydrides by Neutron Diffraction"; A. FURRER, P. FISCHER, SCHLAPBACH, "Localization and Diffusion of **Hydrogen** in Compounds"; B. PEDERSEN, "Nuclear Magnetic Resonance Studies Hydrides"; R.C. BOWMAN, JR., A. ATTALLA, G.C. Studies of **Hydrogen** Relaxation and Diffusion in TiFeHx and TiFe1-yMnyHx";C. KORN, "Electronic Physical Properties of Ti-H and Zr-H Using NMR"; R. J.K. JACOBS and F.D. MANCHESTER, "Electronic States of Alloys From de Haas-Van Alphen Measurements"; H.T. WEAVER, 3He Confinement in Transition Metal Hydrides"; T.B. "Kinetics of **Hydrogen** Absorption and Desorption"; D.L. Storage and Release of **Hydrogen** From **Magnesium** Alloy **Hydrides** for Applications"; G. BOUREAU and O.J. KLEPPA, "High of the Solid Solutions of **Hydrogen** and Deuterium in Palladium and in the Pd0.9Ag0.1 Alloy"; C.D. GELATT, "Calculated Heats of Metal and Metal Alloy Hydrides"; C.J.M. NORTHRUP, W.J. "Acoustic Emissions During Hydride Formation"; W.E. WALLACE, Electrical Properties of Rare Earth and Rare Earth Intermetallic K.H.J. BUSCHOW and A.R. MIEDEMA, "**Hydrogen** Absorption in Intermetallic Compounds"; H.H. van MAL and A.R. MIEDEMA, Applications of LaNi5-Type Hydrides"; M.H.J. van Hydride Electrodes for Electrochemical **Energy** Storage"; K.H.J. "Change in Magnetic Properties of Rare Earth-Transition Metal H2-Absorption"; G. BUSCH, L. SCHLAPBACH and T. von "Hydrides of Rare Earth-Nickel Compounds: Structure and Formation Enthalpies"; G. BUSCH, L. SCHLAPBACH and A. SEILER, RE Ni5 and RE Co5 Hydrides"; J.J. REILLY, Properties of Useful Metal Hydrides: a Review of Recent Work at National Laboratoroy"; H. WENZL and K.H. KLATT, "The Use of **Production** and Storage of Suprapure **Hydrogen**"; Y. MACHIDA, T. ASANUMA, "Hydride Formation of C14-Type Ti Alloy"; J. D. DAVIDOV and D. SHALTIEL, "**Hydrogen** Sorption Properties Pseudobinary Intermetallic Compounds"; G.D. SANDROCK, "The **Production** of Rechargeable Hydrides"; C.E. LUNDIN and F.E. Rationale for the Hysteresis Effects Observed in Metal-**Hydrogen** HEMPELMANN, D. OHLENDORF and E. WICKE, Low Temperature Calorimetric Properties of TiFe by **Hydrogenation**"; M. M. ELEMELACH, "Heat Transfer Characteristics of POrous Metal Hydrides"; S.J.C. IRVINE and I.R. HARRIS, "The Disorder on the **Hydrogenation** Behavior of the

Phase ZRCo"; A.J. "Comparison of **Hydrogen** Absorption in Glassy and Crystalline VIDEM, "Electrochemical Utilization of Metal Hydrides"; F.A. "**Hydrogen** Storage Electrode Systems"; A. SARRADIN and G. BRONOEL, "**Hydrogen** Electrochemical LaNi5 Compounds"; B. VIGEHOLM, J. KJOLLER, B. SORENSEN, "Research on Zirconium Hydriding and Palladium Systems at Riso National Laboratory"; W.E. WALLACE, "Rare Actinide Intermetallics as **Hydrogenation** Catalysts"; S. SUDA and M. "Mixing Effect of Two Different Types of Hydrides"; J.J. "Applications of Metal Hydrides"; I. SHEFT et al., for Evaluation of Hydrides as Chemical Heat Pumps"; H. BUCHNER, **Hydrogen**/Hydride **Energy** Concept".

CC 72 SPECIAL PUBLICATIONS

CT Hydrides; **Energy** storage

ET P; B; Fe*H*Ti; Fe sy 3; sy 3; H sy 3; Ti sy 3; TiFeHx; Ti cp; cp; Fe cp; H cp; C*Fe*Ti; C sy 3; TiFe1-yMnyHx";C; Mn cp; C cp; H*Ti; Ti-H; H*Zr; Zr-H; Pd0.9Ag0.1; La*Ni; La sy 2; sy 2; Ni sy 2; LaNi5-Type; La cp; Ni cp; T cp; T; Ni5; Co5; H; Y; C; Ti; J; D; Fe*Ti; Fe sy 2; Ti sy 2; TiFe; LaNi5; S; I

L49 ANSWER 32 OF 34 COMPENDEX COPYRIGHT 2004 EEI on STN

AN 1977(5):2005 COMPENDEX DN 770535767

TI ON THE STORAGE OF SOLHYDROGEN.

AU Abdel-Aal, H.K. (Univ of Pet & Miner, Dhahran, Saudi Arabia); Nazmy, M.Y.

SO Heliotech and Dev, Proc of the Int Conf, Dhahran, Saudi Arabia, Nov 2-6 1975 Publ by Dev Anal Assoc, Cambridge, Mass, 1976 v 1 p 418-428

PY 1976

LA English

AB Methods of storing **hydrogen produced** by solar **energy** are: **liquid hydrogen** for overseas transportation; **liquid** ammonia which has to be cracked to give H2 back; or absorbed **hydrogen** in metal **hydrides** such as **magnesium** or iron-titanium hydride. Metal hydrides can be decomposed releasing their **hydrogen**, while the metal can be used once more in a closed cycle. The availability of metals such as magnesium if recovered economically from sea water, can reinforce the potential of metal-hydrides for storing **hydrogen.** 21 refs.

CC 615 Thermoelectric & Other Power Generators; 657 Space Physics; 901 Engineering Profession; 804 Chemical Products

CT *SOLAR **ENERGY**:**Energy** Storage; **HYDROGEN** INORGANIC COMPOUNDS:**Manufacture**

ST SOLHYDROGEN

ET H2

L49 ANSWER 33 OF 34 COMPENDEX COPYRIGHT 2004 EEI on STN

AN 1975(5):4815 COMPENDEX DN 750531125

TI WHY A **HYDROGEN** ECONOMY?.

AU Slesser, M. (Strathclyde Univ, Scotl)

SO Chart Mech Eng v 22 n 2 Feb 1975 p 57-60 CODEN: CHMGAF

PY 1975

LA English

AB The advantages of **hydrogen** as a"clean"**fuel**, made from an abundant source (water) through the medium of several heat and

energy sources, are mentioned but perhaps the most important advantage of **hydrogen** is its storage capability, as compared with electricity. This feature would be particularly advantageous with such intermittent **energy** sources as tidal wind and solar **generators**, which could **produce** electrolytic **hydrogen** for storage and transmission to point of use. It is estimated that **hydrogen** is cheaper to transmit by pipeline than electricity for distances greater than 500 km. This immediately opens up enormous prospects. If **hydrogen** can be **produced** by thermochemical means from nuclear power stations located at remote sites at efficiencies of 45 percent, and then converted to electricity at the points of use by **fuel** cells, whose efficiency may be as high as 85 percent, then the overall system efficiency of conversion of nuclear **energy** into electricity may be raised to something like 30 percent, including transmission. **Hydrogen** storage for surface transport to remote locations may well be through the use of **hydrides. Magnesium hydrides**, for example, hold in solid form at room temperature as much **hydrogen** per unit volume as **liquid hydrogen**, and it can be released in controlled manner by heating to about 260 deg C.

CC 804 Chemical Products; 615 Thermoelectric & Other Power Generators

CT *HYDROGEN; ELECTRIC POWER **GENERATION**:**Energy** Resources

ST **HYDROGEN** ECONOMY; THERMOCHEMISTRY

L49 ANSWER 34 OF 34 JAPIO (C) 2004 JPO on STN

AN 2000-054042 JAPIO

TI **PRODUCTION** OF **HYDROGEN** STORAGE ALLOY

IN SAKAI TETSUO; TAKESHITA HIROYUKI; SHIMADA YUKA; ISHIHARA KOZO; MATSUKAWA KIYOTAKA

PA AGENCY OF IND SCIENCE & TECHNOL
NIPPON KAGAKU YAKIN CO LTD

PI JP 2000054042 A 20000222 Heisei

AI JP 1998-229432 (JP10229432 Heisei) 19980729

PRAI JP 1998-229432 19980729

SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000

IC ICM C22C001-04
ICS C22C014-00; H01M004-26; H01M004-38

AB PROBLEM TO BE SOLVED: To provide a **hydrogen** storage alloy high in discharging capacitance, good in charging and discharging cycle characteristics and suitable as the negative electrode material of an alkali secondary battery such as a nickel-hydride battery. SOLUTION: This method for **producing** a **hydrogen** storage alloy is the one in which raw material powders containing a raw material A composed of at least one kind selected from Ti, Zr, Hf, Nb, Ta, **Mg** and the metal **hydrides** thereof and a raw material B composed of at least one kind selected from Ni, Co, Mn, Al, Cr, V, Cu, Zn, Sn, B, Si, Sb and Fe in the ratio of A/B (atomic ratio)=0.3 to 3 are mixed, after the resultant powdery mixture is compacted, is sintered at the temperature below the m.p. of the raw material powders and also at the temperature below the m.p. of the alloy to be formed.

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